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THE IRON TRADE REVIEW

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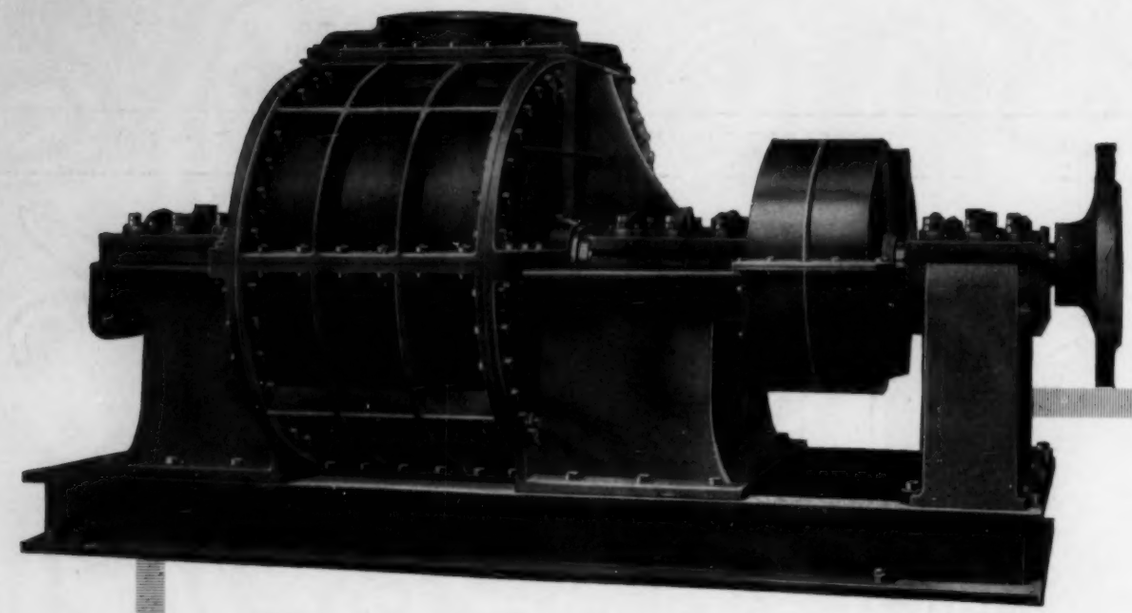

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THE IRON TRADE REVIEW

Vol. LXII Cleveland, January 24, 1918 *No. 4*

Industry Awaits Promised Relief

Survey of Conditions in All Districts Shows Little Evidence of Quick Improvement in Strangling Traffic Congestion, Due to Coal Conservation Effort—Production Makes Better Showing Through Liberal Exemptions

FOUR days of mandatory stagnation of industry have yet to prove their concrete benefits to iron and steel plants. Such improvement, to be of consequence, can come only from a sustained relief from the traffic blockades which have been strangling the industry for a number of weeks. Reports from all districts, barring St. Louis, where conditions have not been acute, fail to show that the fuel conservation campaign has brought about a foundation for permanent betterment. The activities of the industry have been widely affected by the enforced shutdowns. Production has remained only fractional. On the whole, however, especially in initial iron and steel operations, which have been exempted, the output probably has been larger the past week than during the several weeks preceding, when inadequate transportation had demoralized the whole industry.

Reduced Melt Helps Stacks

The position of merchant makers of pig iron has been improved somewhat because the shutting down of the plants of hundreds of consumers has brought some relaxation to the tense demand for deliveries. Some arrearages have been met. The maximum benefits from the cessation of melt, however, have not been realized, because coke shortages have continued to prevent normal furnace production. Except for further active selling for last half by certain producers along the lakes the week's new business has not been heavy, but more makers are disposed to negotiate. One maker sold 40,000 tons, embracing numerous individual lots. Heavy inquiries of basic remain unsatisfied in various districts.

Faith is expressed in coke circles that the fuel conservation campaign will work an appreciable improvement in the Connellsville coke region. Operations of the ovens during the week have been very erratic, owing to the irregular placing of cars. The car supply is estimated to have been about 45 per cent. The plan to pool shipments has been adopted and details are being perfected. Nothing has come from the reported intention of the fuel administration to commandeer a large amount of coke in behalf of two large steel works, the protest from eastern merchant operators apparently having been effective.

More Willing to Sell

Manifestations of more liberality in selling policies are being given by producers in finished lines. This undoubtedly is related closely to the fact that live tonnage, disregarding government business, gradually is being worked away. Bars probably reflect this changing attitude of the mills more than any other product. Implement manufacturers have made further first quarter and first half purchases. Sales of pleasure automobiles, especially of the medium-priced types, have been heavier than expected and that industry now is slated for 50 per cent operations. This is somewhat better than appeared likely from previous indications. Cancellations by fabricators of shape and plate tonnages placed with eastern mills before the regime of government prices have been duplicated in steel bars. The fabricators as well as nut, bolt and rivet makers have taken such action. In shapes, however, the shops have indicated a willingness to take their tonnage but the situation is complicated because the mills have been turned to shell steel rolling. Some platemakers have shown in instances a disposition to mark down some of the extremely high-priced tonnage under contract to encourage specifications.

No Contracts for Ore

The reservations of lake ore for the new season now reach a heavy tonnage, but there have been no contracts. Nor is there likely to be until about April 1, when the question of whether the usual 12-month term will be followed is expected to be reviewed finally by the government. The operators are having difficulty in planning their winter mining activities because of the uncertainty over their sales tonnage. Operations have not been affected by the coal order. As a result of the restricted operations of the furnaces, it is estimated that the consumption of lake ore during the winter months will be probably 2,500,000 tons below that of a like period a year ago.

The Iron Trade Review

EDITORIAL

Transportation Outranks All

A CLEARER visualization of what war means and requires in individual as well as collective sacrifice is held by the nation at large after the swift developments of the past week. The country has been put to the test in a severe and far-reaching manner which it had no reason to anticipate, through the abrupt throwing of the brakes upon industry by the momentous order of the fuel administration. It was a natural reaction from the shock of so sudden and radical an undertaking that a storm of protest should have swept immediately through the country. It is as equally characteristic and in keeping with the concepts of true Americanism, that the country, having expressed its impulsive opinion over the cause, necessity, and selection of such an unprecedented proceeding, should have lent its energies without stint, if not wholesouledly, to the things asked of it; and now is concerning itself more with the efficacy of the plan rather than with its defects.

It is certain that these reasons which brought forth the summary order to industry and general business to forego their normal everyday activities, in order to conserve both coal and cars, were grave and compelling. As much is made clear if not specific by the statement of the fuel administrator as to the paralysis of shipping along the Atlantic seaboard where hundreds of loaded ships have been tied up awaiting bunker coal and freight tonnage has been overflowing piers, warehouses and railroad yards, with each passing day making the confusion more desperate and hopeless as to ordinary measures of relief. There is a strong suspicion that the situation had reached a point far more serious than generally understood. When the mind is allowed to dwell upon the fact so repeatedly and vigorously emphasized before the country that ships are the biggest single factor in the winning of the war, and ships mean the bridging of the resources of America with the battle line in Europe, the critical importance of keeping the only-too-few bottoms in constant motion is driven home. Our bare obligations to our allies, if not the furtherance of our war plans abroad, call for an uninterrupted stream of those essential supplies for which they look to us on our word.

Since shipping is so vital in the present struggle it is not difficult to picture the fatal lengths to which its retardation and stagnation might be allowed to extend. If the causes underlying the present astonishing demand upon the business life of the country are shaped by the question whether or not the movement of the ships is to be kept at top speed, only the most energetic and vigorous means promising correction within the briefest time could be countenanced. It matters not how and why conditions have come to this emergency. These are questions for which the fixing of responsibility may be left to future time. Action, swift and decisive, is the only factor that counts. The country must reserve its decision whether the present course of action is the wisest and most effective until all the facts are known and the proposed remedy has had its full trial.

Industry has one, and only one, big duty at present. That is to win the war. The objective of all output is the European battlefield. It may be shown that production which exceeds the facilities to transfer it to the point of application, is valueless and virtually obstructive to the best results. An intolerable condition of operations lately has prevailed in the iron and steel industry. It were far better from the standpoint of efficiency and from actual production to have abandoned a crippled activity for a complete temporary suspension, if by so doing the industry could have assured itself of the opportunity of free and unrestrained movement. Any way the coal problem is viewed it becomes one of transportation. Until the blockaded cars and the ships are freed and kept nimble, production figures may not be accepted at face value.

Comprehensive Distribution Necessary

WHETHER his figures will bear close scrutiny and are free from bias, a recent announcement by Secretary Wilson of the federal department of labor is of interest. Commenting on the apparent shortage of labor and the proposition to allow importation of oriental workers to fill the gap, he states that the government will take 1,500,000 workers for war purposes. He states there are 35,000,000 workers in the United States and that the number required for war work, 1,500,000, is less than the normal number of unemployed.

This showing would indicate that the problem is more a readjusment than a shortage and the situation should work itself out readily with time. It would indicate that while there is a real shortage in some lines there should be a surplus in others from which the former can draw its needed supply. If this is

the case intelligently applied classification should remedy the situation and should utilize all available labor to the best advantage.

It is a fact, that needs only a little observation to establish its truth, that labor at present is in a state of migratory unrest. Some industries are paying unusually high wages. All workers have a natural desire to participate in the advantages others enjoy. False or exaggerated reports of labor shortage in some industries are responsible for much of the unrest among workers. This has the effect of demoralizing effort and of seriously reducing production.

Systematic planning and far-sighted regulation are needed to remedy this situation and no more important task confronts the government. If there is sufficient labor it should be distributed to serve all needs according to a comprehensive and integrated program.

War Halts Commercial Growth

REVERSALS of policy have been frequent in the iron and steel market since the war unsettled established conditions and gave new aspects to the situation. For many years as the steel industry expanded efforts of makers have been directed to enlarging the uses of metals in place of other materials to broaden their fields and create new demand for their output. Much thought has been given to this aspect of the business and the use of steel in many forms has been created to the exclusion of other materials, wood, paper and nonferrous metals.

At present, with demand for steel and iron in excess of production, it has been necessary to curtail their use in such lines where other materials could be substituted. Instead of seeking to broaden their field, makers of steel and iron have been forced into an opposite attitude and are seeking to restrict it to channels where no other material will serve.

Railroads have bought cars built of wood where nothing but steel was used in recent years; cans and boxes of wood and paper have been substituted as containers for tin plate for products where they would suffice; and reinforced concrete has been resorted to freely where fabricated steel structurals would have been used under normal conditions. The list might be extended but these examples will suffice.

After the stress of war is over and business gets back to a basis where production catches up with demand, the steelmaker will be back at his former position and will resume his campaign to encourage the use of metal where now he discourages it.

Great Britian Finds Herself

TWO years of government control of Great Britain's iron and steel industry have been marked by sweeping modifications of pre-war conditions. In that period state regulation of the works has been rendered practically complete. In fact, the subservience and co-ordination of the facilities of individual manufacturers to the national good as dictated by the war, have been much more absolute than under the system so far advanced in this country. What the two years have meant to Great Britain from the standpoint of national profit and also the economic importance of these evolutionary changes are told in an analytical and expert way in the highly complete article in this issue by the British correspondent of THE IRON TRADE REVIEW.

It is shown it was not until government control intervened that the industry entered upon the era of great expansion and of economic betterment which still is in full swing. For two years the doctrine of "business as usual" was a retarding influence. Individual policies were followed. The taking over of the conduct of the industry by the government in November, 1915, quickly brought about several policies of national scope and vision. The results accomplished are impressive. Starting with a production of 7,500,000 tons annually before the war the British output of steel rapidly is approaching the 12,000,000-ton mark; and if the war lasts this capacity may be raised to 14,000,000 tons, it is stated officially. More complete and efficient working of the native iron ore deposits has been brought about. Shortages of pig iron have been made up by the more extended and skillful substitution of scrap. Many works have been rebuilt, enlarged and greatly modernized. Prices have been effectually regulated and distribution has been directed along the lines of greatest necessity. The labor situation has been handled with a minimum of friction.

This war will leave the British iron and steel industry in a position of greatly enhanced advantage and strength for the future conquests of peace. Likewise it will have greatly improved the national economic position. Will this conflict have the same effect for the United States? A survey with profit may be made of what Great Britain has done. While the conditions facing the two countries at the outset of the war have been dissimilar in many ways, Great Britain's performance contains much of value to the United States.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 296

PIG IRON

Bessemer, valley	$36.30
Bessemer, Pittsburgh	37.25
Basic, Pittsburgh	33.95
Basic, eastern Pa.	33.00
Basic, Buffalo	33.00
Malleable, Pittsburgh	34.45
Malleable, Chicago	33.50
Malleable, Philadelphia	34.00 to 37.50
Malleable, Buffalo	33.50

GOVERNMENT SCHEDULE

1.75 to 2.25 silicon (No. 2 foundry, No. 2 plain, and No. 3 southern)	$33 furnace base
2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern)	base plus 50c
2.75 to 3.25 silicon (No. 1X No. 2 soft)	base plus $1.50
Over 3.25 silicon	$34.50, plus $1.00 for each ½ per cent of silicon.

No. 1X, Phila.	35.25 to 35.50
No. 2 foundry, Pittsburgh	33.95
No. 2 foundry, Cleveland	33.95
No. 2 foundry, Ironton	33.00
No. 1 foundry, Chicago	33.50
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.25 to 34.50
No. 2X foundry N. J. tide	34.25 to 34.50
No. 2X foundry, Buffalo	33.50
No. 2 plain, Philadelphia	33.75 to 34.00
No. 2 plain, N. J. tide	33.75 to 34.00
No. 2 southern Birmingham	33.00 to 33.50
No. 2 southern, Cincinnati	36.40
No. 2 southern, Chicago	37.50
No. 2 southern, Phila. del	38.30 to 39.40
No. 2 southern, Cleveland	37.50
No. 2 southern, Boston	39.50
No. 2 southern, St. Louis	35.90
Virginia, No. 2X, furnace	33.50
Virginia, No. 2X, Phila.	36.77
Virginia, No. 2X, Jersey City	37.02
Virginia, No. 2X, Boston	37.27
Gray forge, Pittsburgh	32.95
Silveries, 8 per cent, furnace	46.00
Silveries, 8 per cent, Chicago	48.54
Low phos. standard, Phila.	55.00 to 56.00
Low phos., Lebanon furnace	50.00
Low Phos., Pittsburgh	53.00
Charcoal, Superior, Chicago	37.50
Charcoal, Superior, Buffalo	39.75
Charcoal, southern furnace	43.00

COKE

(At the ovens.)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Wise county furnace	6.00
Pocahontas furnace	6.00
New River foundry	7.00
New River furnace	6.00
Wise county foundry	7.00

FERRO ALLOYS

Ferromanganese, delivered	$250.00
Spiegel, 20 per cent fur.	60.00
Ferrocarbon titanium, carloads, maker's plant	160.00
Ferrosilicon, 50 per cent, Pittsburgh,	175.00
Ferrosilicon, 50 per cent, Pitts., 1st quarter	160.00 to 170.00
Bessemer ferrosilicon, 9 per cent.	$54.00
Bessemer, ferrosilicon, 10 per cent.	55.00
Bessemer ferrosilicon, 11 per cent.	58.30
Bessemer ferrosilicon, 12 per cent.	61.60

Ferrosilicon prices at Ashland, Ky., Jackson and New Straisville, O.

SEMIFINISHED MATERIAL

BILLETS

Open hearth, Pittsburgh	$47.50
Open hearth, Philadelphia	50.50
Open hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forgin, Pittsburgh	60.00
Forging, Philadelphia	63.00

SHEET BARS

Open hearth, Pittsburgh	$51.00
Open hearth, Youngstown	51.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.00
Grooved skelp, Pitts.	2.90c
Sheared skelp, Pitts.	3.25c

SHAPES, PLATES AND BARS

(In cents per pound)

Structural shapes, Pitts	3.00c
Structural shapes, Phila.	3.185c
Structural shapes, N. Y.	3.195c
Structural shapes, Chicago	3.00c
Tank plates, Chicago	3.25c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia	3.435c
Tank plates, New York	3.445c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	2.90c
Bars, soft steel, New York	3.095c
Bars, soft steel Phila.	3.085c
Bar iron, Chicago	3.50c
Bar iron, Phila.	3.50c to 3.685c
Bar iron, Cleveland	3.64c to 3.70c
Bar iron, New York	3.695c
Bar iron, Pittsburgh	3.50c
Hard steel bars, Chicago	3.00c
Cotton ties, Pitts., Jan.	$2.18

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh base	3.25c
Angle bars, Chicago base	3.25c
Standard bessemer rails, mill	$55.00
Stand. open hearth rails, mill	57.00
Light rails, 25 to 45, mill	3.00c
Relaying rails, light, St. L.	75.00 to 80.00
Spikes, railroad, Pitts.	3.90c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	4.90c
Tie Plates, Chicago	3.25c

WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Coated nails, Pittsburgh	3.45
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh	3.95
Polished staples, Pittsburgh	3.65
Galvanized staples, Pittsburgh	4.35
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	4.00

CHAIN, PILING, STRIP STEEL

(In cents per pound)

Chain, ⅜ in proof coil, Pitts	8.00c
Sheet piling, base, Pitts.	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

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SHEETS

In cents per pound)

SHEET MILL BLACK

No. 28, open hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c
No. 28, open hearth, Chi.	5.215c

TIN MILL BLACK

No. 28, open hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c

GALVANIZED

No. 28, open hearth, Pitts.	6.25c
No. 28, bessemer, Pitts.	6.25c
No. 28, open hearth, Chi.	6.465c

BLUE ANNEALED

No. 10, open hearth, Pitts.	4.25c
No. 10, bessemer, Pitts.	4.25c
No. 10, open hearth, Chic.	5.715c to 6.215c
No. 10, open hearth, Phila	4.435c

TIN PLATE

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.75

IRON AND STEEL PIPE

Base Pittsburgh

Base Pittsburgh	Black Per cent off	Galv. Per cent off
¼ to 3 in., butt, steel	51	37½
¼ to 3 in., butt, iron	33	17

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l.	.30
Iron, 3½ to 4½ inches, c. l.	.12½

CAST IRON WATER PIPE

(Class B Pipe.)

Four-inch, Chicago	57.30
Six-inch and over, Chicago	54.30
Four-inch, New York	58.35
Six-inch and over, N. Y.	55.35
Four-inch, Birmingham	52.00
Six-in. and over, Birmingham	49.00

HOOPS, BANDS, SHAFTING

Class A pipe is $1 higher than Class B.

Hoops, Pittsburgh	3.50c
Bands, Pittsburgh	2.90c
Shafting, Pitts., carloads	17 off to list

RIVETS

Structural rivets, Pittsburgh	4.65c
Boiler rivets, Pittsburgh	4.75c
Rivets ⅞ in. and smaller, Pitts.	45 and10 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	50–5 off
Cut thread	40–10–5 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50–10–5 off
Cut thread	50–5 off
Larger and longer	40–10 off
Cold pressed semi-finished hexagon nuts ⅜ in. and larger	60–10–10 off
Cold pressed semi-finished hexagon nuts ⅞ in. and smaller	70–5 off
Gimlet and cone point lag screws	50–10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products January 23, average for December 1917, average for October 1917, and average for January, 1917. Prices are those ruling in the largest percentage of sales at the dates named

	Prices Jan. 23, 1918.	Average prices Dec., 1917.	Oct., 1917.	Jan., 1917.
Bessemer pig iron, Pittsburgh..	$37.25	$37.25	$37.25	$35.95
Basic pig iron, Pittsburgh....	33.95	33.95	33.95	30.95
*No. 2 Foundry pig iron, Pitts.	33.95	33.95	33.95	31.95
*No. 2. Foundry pig iron, Chi.	33.00	33.00	33.00	30.00
Lake Superior charcoal, Chicago	37.50	37.50	48.50	33.75
Malleable, Chicago	33.50	33.50	33.35	30.00
**Southern, No. 2, Birmingham.	33.50	33.50	33.00	23.00
*Southern Ohio No. 2, Ironton	33.00	33.00	33.00	30.00
Basic, eastern Pa.....	33.00	33.00	33.00	30.50
**No. 2X Virginia, furnace....	33.50	33.50	33.50	26.50
**No. 2X foundry, Philadelphia	34.25	34.00	34.00	30.50
Ferro mang., delivered.....	250.00	247.50	302.00	175.00
Bessemer billets, Pittsburgh....	47.50	47.50	58.75	60.00
Bessemer sheet bars, Pittsburgh	51.00	51.00	65.50	60.00
Open hearth sheet bars, Pitts..	51.00	51.00	65.50	60.00
Open hearth billets, Pitts.....	47.50	47.50	58.75	60.00
Steel bars, Pittsburgh.....	2.90	2.90	2.90	2.975
Steel bars, Chicago.....	2.90	2.90	2.90	3.19
Iron bars, Philadelphia.....	3.685	3.685	4.935	3.159
Iron bars, Cleveland.....	3.64	3.64	4.50	3.00

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Prices Jan. 23, 1918.	Average prices Dec., 1917.	Oct., 1917.	Jan., 1917.
Iron bars, Chicago mill.....	3.50	4.50	4.50	2.85
Beams, Chicago.....	3.00	3.00	3.00	3.19
Beams, Pittsburgh	3.00	3.00	3.00	3.075
Beams, Philadelphia	3.185	3.185	3.185	3.509
Tank plates, Pittsburgh	3.25	3.25	3.25	3.575
Tank plates, Chicago	3.25	3.25	3.25	3.89
Tank plates, Philadelphia ...	3.435	3.435	3.435	4.909
Sheets, blk., No. 28, Pitts....	5.00	5.00	7.75	4.56
Sheets, blue anld., No. 10, Pitts	4.25	4.25	7.875	4.125
Sheets, gal., No. 28, Pitts... ..	6.25	6.25	8.8125	6.56
Wire nails, Pittsburgh.....	3.50	3.50	3.875	3.00
Connellsville fur. coke.....	6.00	6.00	6.00	7.25
Connellsville fdy. coke.....	7.00	7.00	7.00	6.375
Heavy melting steel, Pitts.....	30.00	30.00	31.50	23.25
Heavy melting steel, eastern Pa.	30.00	28.75	26.10	21.50
Heavy melting steel, Chicago.	30.00	28.50	27.00	20.25
No. 1 wrought, eastern Pa....	35.00	35.00	40.80	26.50
No. 1 wrought, Chicago.....	35.00	31.50	36.25	25.35
Rerolling rails, Chicago.....	35.00	35.75	36.00	27.25
Car wheels, Chicago.....	30.00	29.50	31.00	21.85

(For Additional Prices See Page 296)

Last Half Sales of Iron Growing

Producers More Willing to Negotiate But Study Contigencies Arising From Mandatory Price Revision Clause in Contracts—Shutdown of Many Consuming Plants Eases Tension of Demand But Furnaces Lose Full Effect

Cleveland, Jan. 22.—Certain producers in this district continue to sell freely for last half to regular customers, but they are unable to supply over 50 per cent of the demands. Usually inquiries are being scaled to about one-half their original amount. The bookings of one important interest in the week totaled approximately 40,000 tons, making an aggregate of 70,000 to 80,000 tons taken within two weeks. All this business is subject to government price revision. Perhaps one-third of the contracts closed have been for malleable, for which there is a large and insistent inquiry. Some sales of this grade have reached 5000 tons individually. Basic remains exceedingly scarce especially for first half. Two northern Ohio consumers continue to scour the market for 15,000 to 20,000 tons each for second quarter, and one of them also is seeking 20,000 tons for last half. Of the 8000 tons of mixed grades asked for the navy department, the low phosphorus has been placed with eastern furnaces and the remaining lots of foundry and charcoal are being placed in various directions. New government inquiries include 800 tons of malleable for first quarter for a western consumer and 1000 tons of high phosphorus foundry for Italy. The position of iron producers, in view of the tense demand, has been improved by the enforced closing of many consuming plants during the past five days. The furnaces, however, have not realized the full benefit of this reduced melt because they have been unable to maintain normal operations.

Revision Clause Employed

New York, Jan. 22.—Foundry iron for second half has been sold during the past week embodying a clause which provides for revision on deliveries after March 31 in accordance with the government price. Business so far done involved only a few thousand tons. This method of selling has not become popular and is unlikely to. In almost all cases, the furnaces prefer to wait rather than sell at anything but a definite price. New inquiries are numerous and consumers are scouring the market more thoroughly than in normal times. A Buffalo consumer who never before bought in this district has inquired here for 1000 tons of foundry. Current inquiry includes some 5000 tons of malleable and at least 25,000 tons of foundry, all for first quarter and first half, and a great deal of tonnage for second half. The largest single requirement is that of a Bridgeport consumer who wants 7000 tons of high and medium silicon for first quarter. Consumers generally realize that iron practically is unobtainable and in very few cases are making insistent efforts to obtain it. Blast furnaces were exempted from the closing order of the federal fuel administrator. All of them, therefore, continued to operate as before. Scarcity of coke, instead of being relieved, has become more acute lately, with the result that none of the eastern furnaces have more than a very scant supply and a good many occasionally are forced to bank temporarily. Some furnaces have lost all the way from one to three months' production through the lack of coke and the effect will be to keep many furnaces out of the market for a

much longer period than expected. Eastern blast furnaces generally are curtailing as much as possible the production of high silicon iron owing to the higher cost. Makers state that after they have completed present high silicon contracts they will make only ordinary grades ranging from 1.75 to 2.75 per cent. As a result, it is expected that foundries will have to depend to a growing extent on 50 per cent ferrosilicon and silveries.

Shutdown Eases Urgency

Boston, Jan. 21.—The Garfield fuel order having closed down a good many New England foundries, a fresh factor of dullness has been introduced into the local pig iron market. To a considerable extent, the shutdown eases off the urgency of the demand from plants, which although covered on iron by contract, were unable because of weather conditions or railroad congestion to secure what was due them, and consequently sought any free iron that cropped out from time to time. The plants engaged on purely government work have not been obliged to heed the Garfield order, although in the confusion which resulted from the lack of notice many did not open Friday morning, and then had something of a scramble rounding up their employes when they learned of their exemption. On the whole, it must be said that the foundries that come within the scope of the order have obeyed the mandate quite gracefully. The loudest complaint about the whole matter has been the very short notice given. The shutdown has not been wholly unwelcome, for it must be admitted that lately there are plants working on nonessentials which have not found new business any too brisk. New building operations, save for war purposes, have been on a rather restricted scale and stove concerns have felt not only the lack of new dwelling construction, but also of the usual amount of household purchases. There have been offers to place orders for delivery up to April 1, and it is believed there will be quite a little business done when the time comes for reopening plants.

Bookings Are Better

Buffalo, Jan. 22.—Somewhat better bookings in pig iron have been reported for the week just ended than for the past few weeks, but the scarcity of metal still continues in the face of a heavy demand. Just at present there is very little iron obtainable before July 1, with the exception of small lots of offgrades which are sold to old customers who must have something. As far as new business is concerned, at least one Buffalo furnace is declining to entertain any proposals, since its prospects are that iron promised for midsummer may not be delivered until considerably later. In fact, it is the opinion of one well-informed furnaceman that some plants which figured on being sold up to July 1, will, in reality, be sold up until Sept. 1, because of intermittent operations. Furnace production is being materially interfered with by the failure to obtain regular shipments of coke and in most cases the fuel is of such low grade as to make an inferior product. There has been a slight departure from the position of the week before when Buffalo furnaces declined to quote for last half because of the possibility of the figures being revised March 31. Some of them are now showing a disposition to take on such business and some tonnages actually are being booked. These, generally speaking, contain the proviso that the prices will be subject to government revision. The idea is entertained in some quarters that prices will be revised upward. One producer told a representative of THE IRON TRADE REVIEW that it would be only simple justice to the merchant pig iron producer for the government to fix a higher price than $33. He gave it as his opinion that a scrutiny of the balances of northern merchant furnaces for a considerable period largely would show "red ink". The inquiry during the past week has been good. The Canadian furnace at Port Colborne has experienced good inquiries and has taken some business. Uncertainty as to supplies of coke has held its offerings to first half exclusively.

Consumption Greatly Curtailed

Cincinnati, Jan. 21.—The five-day shutdown period has applied to all foundries in this vicinity as none has received release orders the same as sent the machine tool builders. Some foundries were already idle on account of a shortage of coke. Shipments of iron are very poor. Iron that was enroute before the receipt of the fuel administrator's recent order, is lost and few new shipments can be sent forward. Iron merchants predict that the reconsigning of iron will soon be a thing of the past. In fact, the practice has already practically been discontinued. This will affect shipments from the south more than from any other producing district. Inquiries for foundry iron are quite numerous, most of which are for shipment in the last half, although some iron is wanted for nearby delivery. Sellers are not now disposed to sell beyond April 1, even when the iron is to be had. They realize fully that the iron shortage is acute and that the future demand will be large enough to take care of all the iron that can be produced. No sales of consequence are reported, although a few cars of southern and Virginia are disposed of now and then.

Chicago Inquiry Active

Chicago, Jan. 22.—Inquiry for all grades of pig iron is growing more active and has attained practically the dimensions of a general buying movement. Only last half business can be booked by most makers and first half tonnage is practically unobtainable. Some delay is being met in concluding transactions as sellers are waiting until a form of contract is decided on to cover a change in prices by the end of first quarter, as provided in government regulations. For this reason, tonnages are being booked informally and tentatively, to be made binding when the form of contract is decided on. Good demand is being met for silvery iron but this is difficult to buy even for last half, as makers appear to have covered a large part of their production. Lake Superior charcoal is in demand and considerable tonnages are being covered for last half delivery.

Coal Order Stops Business

St. Louis, Jan. 19.—The Garfield five-day order fell like a mallet stroke on pig iron activities in this district, giving the coup de grace to what the blizzard and other disabilities had left. Dealers unanimously report "nothing doing" and most of them are not looking for a return to even relatively normal conditions for some days to come. So far as could be learned sales during the week, either for prompt shipment or future delivery, were virtually nil. The order to close down industries, according to best opinion here, will create no easing of pig iron demand and it will be just as hard to secure tonnages as heretofore, save that railroad facilities may be better for the breathing spell.

Second Half Selling Active

Philadelphia, Jan. 22.—Second half selling of pig iron which heretofore has been exceptional became active during the past week. Fully 15,000 tons mostly foundry with some malleable were sold here. All this tonnage is subject to price revision. Sales for earlier delivery involved principally small lots of off-grades, high manganese, high silicon and similar qualities. Many inquiries are current, some running into thousands of tons, mostly for second half foun-

dry. The Penn Seaboard Steel Corp. wants nearly 30,000 tons of basic mostly for second quarter. The Stanley G. Flagg Mfg. Co. wants 3500 tons of malleable, basic and foundry, for first quarter. The coke scarcity has been relieved at some furnaces; at others it still is acute. One New York furnace making standard low phosphorus is out and another on the same grade is on half schedule on account of coke conditions. Even more critical situation, however, has been averted by the indefinite postponement of the government order diverting 100,000 tons of coke to the Midvale Steel & Ordnance Co. and to the Bethlehem Steel Corp. Following the announcement of this order, eastern furnaces whose supply was involved, sent a committee to Washington, pointing out how other government requirements would suffer.

Furnaces' Output Still Restricted

Pittsburgh, Jan. 23.—Operations of blast furnaces in the valleys and the Pittsburgh district continue to be restricted on account of a shortage of coke, but inasmuch as there is a freer movement of fuel and furnaces are expecting supplies at once the production of pig iron promises to show an appreciable increase. The Carnegie Steel Co. has only 36 of its 59 furnaces in operation, while the Jones & Laughlin Steel Co. has only four of its 11 furnaces making iron and those which are producing are checked. Makers have met with fair success in shipping consumers and the Garfield order has had the effect of increasing somewhat the supply of iron at plants of consumers where it was possible to make deliveries. Inquiries for iron for first half delivery are no longer numerous, consumers appreciating the fact that producers are well committed for that period and have no offerings to make. Some producers, however, are taking bookings for the second half, although tonnages sold for that delivery so far are limited. It is believed that second half business will open up briskly soon and consumers will be covered within the next 30 or 60 days. Bookings for last half shipments are taken with the understanding that prices are subject to revision on April 1 and some producers are proposing a further provision that government prices are to apply only during the war, or while federal regulations are in effect, and any business that may be delivered after that period is to be taken at trade journal or open market quotations. One prominent producer is inquiring for 20,000 tons of basic iron for second half to make up shortage output.

Coke Pool Plan Adopted

Representatives of Fuel Administration and Railroads Arranging Details —Movement in Connellsville Region Shows Improvement

Pittsburgh, Jan. 22.—Shipments of coke during the past few days have shown some improvement, partly due to the Garfield order and also to the fact that energetic efforts have been made with some success to relieve the congestion of loaded cars in the Connellsville region. While the tie-up of cars there is still serious and the extremely cold weather has interfered greatly with their movement, large supplies of fuel have either reached furnaces, especially those in the east, or are about to do so. Considerable has been accomplished through the elimination of crosshauls and the trading of tonnages by which the output of ovens at the north end of the region are shipped direct to the east and that of ovens in the south end shipped to the west. Discussion is still being made as to pooling of coke shipment, a question which was gone into yesterday at a meeting in Pittsburgh between Warren S. Blauvelt of the federal fuel administration and railroad officials. Upon the perfection of the detailed plan, it was announced the coke pool will be organized. Mr. Blauvelt has asked for data on production and movement of coke in this district to be submitted to Fuel Administrator Garfield. Pittsburgh, Connellsville and Uniontown are being considered as headquarters for the proposed pool. The committee of coke operators recently named also held a meeting last night at Uniontown, Pa., regarding the distribution of coke shipments. The car supply in the Connellsville region has been low, running from 30 to 50 per cent, and it is expected to increase this after the congestion has been further relieved. The supply today was 30 per cent and will be 30 per cent tomorrow. Production for the week ended Jan. 12 was 237,707 tons, as compared with 216,098 tons during the preceding week, according to the *Connellsville Courier*.

Railroads Want Coke

New York, Jan. 21.—With the exception of long-time contracts which some makers have accepted from eastern blast furnaces of late, the market in this district continues devoid of business. Many inquiries are out for prompt or nearby coke both for foundry and furnace consumption, but none is to be had. Among foundry users who are inquiring are the New York Central and the Erie railroads. The former wants 1000 tons. The New England producer still is out of the market. This interest recently devised a new form of contract to make it accord exactly with the desires of the fuel administrator, but the forms are not yet ready.

Shipping Tangle at Worst

Cincinnati, Jan. 21.—Shipments were never in a worse condition. The oven operators were unable to get cars and the cold weather has made labor very uncertain so that when any cars are placed it is difficult to get them loaded. Railroad delays are more vexatious and no relief can be expected until the weather moderates. Occasionally a few cars slip through from the Wise County field, but they are hard to get across the Ohio river.

Shortage More Keenly Felt

St. Louis, Jan. 19.—Dealers report semiparalysis in the coke trade. Results of the blizzard are still seriously felt and tonnages are increasingly scarce and hard to lay hands on. Eastern ovens are furnishing contract material but are offering nothing for sale. Southern producers are in much the same fix. Southwestern smelters are beginning to feel the pinch more acutely than at any time since the scarcity commenced. Production of lead and spelter is reflecting this and strenuous efforts are being made by the independents to cover their needs. Local distribution sources are frankly informing them they can offer no help. There were the usual number of telegrams from national and state fuel administrations ordering dealers to supply coke to specified points. These have gotten no better results than inquiries of private individuals and corporations. The leading local producer has helped out materially.

Watching Production Closely

Birmingham, Ala., Jan. 22.—While the production of coke is being kept up to above normal in southern territory there is no great confidence over the situation. If big contracts or long-time contracts are being accepted nothing is being said of it. The production is being closely watched, since demands call for the whole output. There was no disturbance of coke making operations following the fuel administrator's coal conservation order.

Propose New Scrap Body

Dealers and Consumers Recommend Formation of General Committee —Many Objections Are Made to Present Price Classifications

FOR COMPLETE SCRAP PRICES SEE PAGE 296

New York, Jan. 22. (By wire.)—Meeting scrap iron dealers and consumers representing iron mills, gray iron, steel and malleable foundries today decided to recommend to the general steel committee of the American Iron and Steel institute the appointment of a new subcommittee on iron and steel scrap. The new committee will include not only scrap dealers and distributors, but also consumers. Representatives of the buyers object to the maximum price on No. 1 heavy melting steel being made to apply to malleable and to cast-iron scrap of all kinds. The iron mills object to the classification under No. 1 railroad wrought of making the price of $35, delivered, to include yard and track scrap, busheling and all kinds of iron scrap. It was decided to recommend that the basis of prices delivered consumers' works be maintained. The recommendations regarding the personnel of the new committee are to be made before the end of the week.

New York, Jan. 22.—Notwithstanding the temporary idleness of many plants as a result of the Garfield closing order and the difficulties attending shipments, a good demand continues to come out for iron and steel scrap. Prices generally have advanced. Old steel shafting now is quoted $37.50 to $38; short city wrought is unchanged at $26 to $26.50, but long stock now is quoted at $32 to $32.50; wrought pipe is held at $31, an advance of $1; mixed borings and turnings have advanced from $15.50 to $16, and stove plates and grate bars, New Jersey points, are held at $21.50 compared with $20.50. The uncertainty as to the scope of the government's price ruling on melting material now appears to be entirely cleared away by the recent explanation of the American Iron and Steel institute. This statement was to the effect that the maximum price of $30, f.o.b. consumers' works, is to be paid for any kind of cast iron scrap, whether car wheels, machinery cast, railroad cast, etc., and whether it is for consumption by a steel mill or not.

Want More Grades Fixed

Buffalo, Jan. 22.—Extreme shortage of certain scrap grades on which the government has not fixed prices has forced up the figures appreciably this week. Bundled stamping scrap from $19 to $20 is up to $22 to $24; stove plate which was $22 to $23 is now $25; locomotive grate bars which were $20 to $21 are $25; No. 1 busheling has gone from $26 to $27 to $30; No. 2 busheling from $17 to $18 to $22 to $24, and wrought pipe from $26 to $27 to $29. The market has been very strong with a real shortage of material due to lack of labor to classify and load. So stringent has the shortage become that for the past two or three months some producers have not attempted to issue a list of grades for sale. Though the sales are few, the demand is heavy. Some local dealers are attending the meeting of the American Iron and Steel institute in New York today, at which it is expected recommendations will be made that a maximum price be placed on every scrap grade. Local dealers say that the expectations of the government that the setting of prices on the main scrap classes automatically would adjust the other grades, have failed to materialize. It has, on the contrary, they say, had a tendency to boost the prices to a maximum on all grades. This is especially noticeable in the case of No. 1 busheling steel. The price of this grade virtually is $35 because it forms such an important component of No. 1 wrought which has been fixed by the government at that figure. Expanding the equation it is readily seen that the price of shoveling steel of which No. 1 busheling also forms a part is affected. Furthermore, 20 per cent of shoveling steel always has been accepted as a part of heavy melting steel. The government price on this grade is $30. The inextricable relation of the various grades, it is pointed out, has made the $30 price of heavy melting steel an anomaly. Buffalo consumers are confronted with a very serious situation because of the lightness of their stocks.

Strength Is Shown

Boston, Jan. 21.—The scrap market still shows decided strength on a limited volume of business, the latter being due to a lack of anything like normal transportation facilities. The closing down of the foundries is expected to add to the shortage that now exists in cast scrap. Offerings of rerolling rails are still a little too heavy for the market to absorb. Wholesale dealers' paying prices per gross ton f.o.b. shipping points follow: Wrought, No. 1 yard long, $30 to $31; horseshoes, $30 to $31; cotton ties, $22 to $23; stove plate, $20 to $20.50; No. 1 machinery, $33.50 to $34.50; No. 2 machinery, $28 to $29; car axles, iron, $43 to $44; steel, $43 to $44; rerolling rails, $30.50 to $31; iron boiler plate, $34 to $35; bundled barrel hoops, $17.50 to $18; wrought iron pipe, new specifications, $27 to $28; steel rails, $26 to $27; No. 1 railroad steel, $26 to $26.50; heavy melting steel, $25.50 to $26.50; axle turnings, $20 to $21; machine shop turnings, $13 to $16; cast borings, $17 to $17.50; drop forge trimmings, $21 to $22; cast iron car wheels, mill price, $35 to $37.

Inquiries Are Active

Cleveland, Jan. 22.—Inquiries for iron and steel scrap in this district are as plentiful as available freight cars are scarce, and the net result has been little or no business. On account of the Garfield order the trade has been virtually at a standstill since late last week, and dealers are fearful lest the ban on shipments be continued by some railroads. A western Pennsylvania melter is making inquiries for 1000 tons each of clean machine shop turnings, clean cast iron borings and heavy breakable cast machinery scrap. A sale of No. 1 busheling has been made at $28.50 net, or $31.92 gross. Drop forge flashings, large and small, have been advanced approximately 50 cents, while short steel rails are bringing about $1 more than last week. Dealers have yet to be convinced of the good the Garfield shutdown period may accomplish, although they are hewing to the line.

Storm Stops Trading

Chicago, Jan. 22.—Storm conditions that closed most plants all last week and five days of enforced idleness after that, resulting from the fuel conservation order, has caused trading in iron and steel scrap to drop to a minimum. With consumption cut off short over a period of about 12 days the attention of buyers has been directed elsewhere for the time being, to the detriment of trading. Prices are on an upward grade on all classes on which a maximum figure has not been declared. Rises are steady in the face of shortage of material, even though consumption also is reduced. In fact there is little scrap in the market. all sources usually producing

it being less productive than usual. Railroads are offering little, having too much work on hand digging out from the snow and getting coal and other traffic moving again. The Rock Island offers 750 tons and the Monon 185 tons in current lists.

Pittsburgh Market Firm

Pittsburgh, Jan. 22.—The market for scrap is firm and limited sales are being made by brokers who are allowed 3½ per cent commission. There is some dispute as to whether the commission can be paid to those who are purely yard dealers and who sell directly to consumers from their stocks. Brokers, however, who may or may not have supplies but who in the past have acted as agents supplying consumers are being allowed commissions on sales. While the market in this district has been dull it is due to the fact that consumers are unable to cover their requirements and have either withdrawn inquiries or are quietly seeking tonnages. Dealers are greatly handicapped and are not able to get sufficient supplies and are also meeting with difficulties in making shipments owing to embargoes. The greatest demand involves heavy melting and low phosphorus steel and there is some inquiry for hydraulic compressed sheets which are now quoted at from $27 to $28, f.o.b. consuming points, but are scarce.

Shipments Virtually Nil

Cincinnati, Jan. 21.—All of the scrap yards are closed and will not be opened until Wednesday morning. As it is almost impossible to make any outside shipments dealers state that the yards might as well be closed the entire week or until the weather moderates. In the absence of transactions there can be no changes in previous quotations.

Study Coal Order Effect

St. Louis, Jan. 19.—The market for scrap iron and steel here is at a standstill. Buyers, while in need of material, are holding off, and sellers are not pressing matters, owing to uncertainties attending deliveries. Prices throughout the week remained stationary, with the exception of a few minor changes in miscellaneous grades. Dealers are undecided as to what ultimate effect the Garfield order will have. Some believe it will help out by putting more freight cars at the disposal of scrap shippers. Others, however, believe that this feature will be more than offset by reduced demands consequent to closing down of plants and that the railroad relief will bring in old contract shipments, long delayed.

Settle Shell Controversy

Questions Over Specifications for Projectile Steel Are Adjusted—Acute Shortage in Billets and Sheet Bars—Rods in Demand

Youngstown, O., Jan. 23.—Producers and ordnance department officials met in Baltimore this week to discuss further the chemical specifications for shell steel which, according to makers, was causing a 20 per cent loss in production of the steel. While no details were announced, it is understood a compromise between the manufacturers and the representatives of the government was effected. As a result of the failure of the railroads to clear mill yards of loaded cars during the 5-day suspension, many thousand tons of shell steel are waiting shipment. One large producer received several telegrams for a Detroit munition maker asking that shell steel be forwarded at once as the latter's stock of this material is about depleted. Similar telegrams were received from munition plants in the Cleveland district. The steel, however, cannot be shipped, due to embargoes and shortage of cars. It is understood priority orders no longer have any effect either on production or transportation of steel, and they may be discontinued.

Small Tonnages Are Sold

Pittsburgh, Jan. 22.—Small tonnages of sheet bars have been sold in this district, but there is an acute shortage of both sheet bars and billets. While there is a pressing need on the part of consumers, most of them have withdrawn from the market, realizing the impossibility of covering their requirements. The shortage in the output of billets and sheet bars is due principally to the lack of pig iron. Operations of mills in this district do not exceed 70 per cent of capacity, having been reduced since the railroad situation has become so serious. Considerable bessemer tonnage is being supplied by makers on contracts in order to conserve the supply of open-hearth material for the government. The resulting reduction in the output of sheets will make it impossible for consumers of the latter product to secure adequate tonnages.

Fairly heavy demand is being made for wire rods and this comes from both domestic and foreign consumers. Some mills are not taking any tonnages. Business for shipment to the orient has been closed. Some domestic consumers also were supplied with tonnages. Canada, France and Italy have been in the market, but railroad embargoes have made it impossible to ship to Atlantic ports and therefore European countries have been unable to cover their requirements.

New Strip Business Light

Pittsburgh, Jan. 22.—Operations of plants making cold rolled strip steel are considerably below capacity and new business coming to them is light. The government is buying tonnages, some being placed indirectly. The automobile trade has not entered the market actively as yet to take care of its purely domestic requirements, but there has been some buying for motor trucks, ordered by the war department. The prospect of price revision on April 1 together with railroad embargoes has also affected the market for cold rolled strip steel.

Ore Producers

Await Price Fixing Before Planning Season's Work

Cleveland, Jan. 22.—Reservations of iron ore for delivery this year continue to be made by buyers and sellers but actual contracting will await further developments in the government's price-fixing program. The ore trade would like to see definite developments soon in order that the uncertainty regarding mining operations this season might be cleared up. Ore operators, generally, by midwinter have been able to plot out their mining schedules so as to supply the ore which had been sold.

Plans for handling the ore shipments this summer will be formulated in March by the mobilization committee of lake vessel owners. Centralized direction will be followed this year in handling all lake trade, as well as the coal shipments from mines to lower lake ports. This plan is expected to bring into play at all times the maximum freight moving capacity of the lake fleet and to avoid most of the delays which seriously retarded the vessels last summer.

Index is Ready

The index to Vol. LXI of THE IRON TRADE REVIEW covering the last six months of 1917 now is ready for distribution. Copies will be sent to all subscribers who express their desires for them.

Bar Contracts Repudiated

Fabricated Shops and Nut, Bolt and Rivet Makers Decline to Take Out Tonnage—Auto Industry Outlook Improves

Philadelphia, Jan. 27.—Many thousand tons of steel bars which were on a contract for the last quarter of 1917 have been repudiated principally by fabricators, and by rivet, nut and bolt makers. The latter say that by taking the bars at the contract prices they are unable to come out even at the government prices on their products. In many cases it is probable they will have to take this tonnage, as they are unable to place new lots at the government bar prices of 2.90c, Pittsburgh, because of the huge tonnage of shell rounds which the bar mills are rolling. The Pennsylvania railroad wants 1000 tons of steel bars. Iron bars are quiet and continue to sell at 3.50c, Philadelphia.

Automobile Demand Liberal

Cleveland, Jan. 22.—Business lately booked for the coming season by builders of pleasure automobiles has been very liberal and the outlook for better operations of this industry has been improved. A great portion of the demand has been for moderate-priced cars, while the sale of the higher priced machines has been light. These divergent conditions, it is estimated, will produce about a 50 per cent capacity operation of the whole pleasure car industry during the coming year. Part of the capacity of some of the higher-priced makers is being devoted to war work. Implement manufacturers in this district have been placing orders for their needs of rail steel bars and other sections over the first quarter. These are in the form of specifications, since makers are not entertaining contracts. Some negotiations for soft steel bars for first quarter and for first half also are going forward. Some makers have intimated they may take first half tonnage. Several inquiries for bars for war work remain under negotiation.

Demand Fair at Chicago

Chicago, Jan. 22.—Soft steel bar business is practically stifled in this territory by the cessation of traffic due to the snowstorms of a fortnight ago and the plant closing order of the fuel administration. In spite of this demand is fairly heavy in this as in all finished steel products. The leading interest continues to sell small tonnages to regular customers for delivery at convenience, subject to announced prices at the time of delivery. During the past week specifications have been filed in unusually large volume, though most were on government tonnages. This is especially true of material for ship construction. Bar iron makers are selling only spot material and have not yet begun to book second quarter or last half business. The likelihood seems to be that when such contracts are made they will carry a cancellation provision to protect buyer and seller in case prices prove unsatisfactory. Hard steel bars are inactive and most mills in this territory have been idle for nearly two weeks on account of storm and fuel conditions.

Implement Makers Want Bars

Buffalo, Jan. 22.—There has been a fair demand for bars and shapes in this market on the part of makers of agricultural implements and some bookings. The additional bar and plate tonnage inquiry is on account of new war orders.

Iron Bar Makers Busy

Pittsburgh, Jan. 22.—Books of makers of iron bars are comfortably filled with orders which have been taken from various sources. Considering transportation conditions, deliveries are being made in a satisfactory manner. Some of the requirements are being placed either directly or indirectly for the government. The buying of iron bars as in other lines has been checked somewhat on account of the fact that prices are subject to revision on April 1. Specifications for soft steel bars are being made rather freely and implement makers are contracting for their first half requirement. The output of bar mills has been greatly curtailed on account of traffic congestion, and some of them have had to suspend operations temporarily. The government is understood to have placed large orders for steel rounds.

Congestion Relieved Somewhat

Pittsburgh, Jan. 22.—Shipments of nuts, bolts and rivets are expected to become less difficult if the Garfield order succeeds in relieving traffic congestion. Railroad embargoes have had a serious effect upon makers of nuts, bolts and rivets, making it impossible for them to ship more than 50 per cent of their output and some of them have not been able to ship at all. They also have had extreme difficulty in getting steel bars for a similar reason. Demand is active, a great part of it coming from interests engaged on government contracts.

Embargoes Affect Shafting

Pittsburgh, Jan. 22.—Railroad embargoes have greatly affected shipments of cold rolled shafting and this has compelled some makers to suspend entirely or curtail operations. The government is placing requirements for relatively small tonnages of shafting.

Hoop Demand Is Active

Pittsburgh, Jan. 22.—Active demand continues to be made for hoop steel and comes from barrelmakers and miscellaneous manufacturing lines. Producers have been able to take care of requirements and to promise satisfactory delivery. The market for bands is less active and some makers are unwilling to take the business at 2.90c, Pittsburgh, the steel bar price.

More Activity

Shown by Private Cast Pipe Buyers —Oil Interests Inquire

New York, Jan. 22.—Considerable demand for cast iron pipe is noted in the east. Private consumers during the past week have been showing more interest in their requirements. These requirements in some instances have been accumulating for several months. A factor in the present demand is the feeling in many quarters that there is little possibility of a downward revision in prices by the government April 1. Public work at this time is scarce. Export trading also is at a standstill owing to the inability of shippers to obtain vessels. Several inquiries which have been before the market for a number of weeks are being held up. Undoubtedly, much foreign trading would be done if it were not for the present shortage of bottoms. Pipe plants generally have suspended operations temporarily in compliance with the Garfield closing order.

Oil Interests Seek Tonnage

Pittsburgh, Jan. 22.—Oil country interests are making active demand for lap weld iron and steel pipe, but a number of makers are unable to take this business, while others are able to take some tonnages. Producers have been meeting with fair success in catching up on deliveries and in the case of butt weld iron pipe, the inquiry for which is extremely dull, tonnages can be taken for prompt

shipment. Makers of butt weld steel pipe are from one month to 18 weeks behind on deliveries. Independent makers are from one to six weeks behind on shipments of lap weld pipe while the leading interest is about 60 weeks behind.

Alabama Plants Shut Down

Birmingham, Ala., Jan. 22.—The cast iron pipe plants in the Birmingham district shut down following the orders of Fuel Administrator Garfield and there will be no resumption until the middle of this week. Plants in the Anniston section were practically down before the coal conservation order was issued because of the dull market. There is hope of an early recovery in the market, as municipalities and others are making preparations to figure on specifications for spring and summer needs. Machine shops and foundries generally in the Birmingham district managed through special permission and by reason of the fact that they use power from the Alabama Power Co., a hydroelectric company, to continue in practically full operation.

Spiegel Advanced

By Eastern Maker, But Sales Still Lower—Ferro Less Firm

Pittsburgh, Jan. 23. (By wire.)—The market for 80 per cent ferromanganese has softened, and is now quotable at $240 to $250, delivered, for nearby delivery. A consumer in Ohio is understood to have taken 150 tons, for delivery during January, February and March at $240.

New York, Jan. 22.—One of the principal eastern producers of spiegeleisen has advanced his price on this metal to $75, furnace. The advance resulted from this interest's desire to turn away business temporarily. Other makers still are taking such business as is offered, at $60, furnace. In some cases, $61 and $61.50 are being obtained for carload lots for quick shipment.

Some Sales Are Made

Pittsburgh, Jan. 22.—Limited lots of 80 per cent ferromanganese for first quarter shipment have been sold at $250, delivered. Inquiry is light. Demand for 20 per cent spiegeleisen is not active. Some tonnages for nearby delivery have been sold at $60, furnace. Considerable demand for the lower grades of bessemer ferrosilicon exists, but makers are well committed for the first half.

Plate Production Rushed

Urgent Needs of Fleet Corporation Keep Mills Operating Through Conservation Period—Coal Lack Restrains Eastern Output

Pittsburgh, Jan. 22.—Mills making sheared plates for the Emergency Fleet corporation or other government purposes were exempted under the Garfield order and have continued to operate without interruption. The government is desirous of obtaining as much plate and fabricated tonnage as it can in the shortest time possible in order to hasten the shipbuilding program. With this end in view, plate mills and fabricating shops doing Emergency Fleet corporation work have been kept in operation. There has been some speculation in the trade as to whether or not concentration of production of plates and fabricated material would not actually result in a congestion at the shipyards and be the possible cause of having to curtail plate and fabricated output. Such a result would be directly contrary to the interests of the shipbuilding program, but the production has been so great that some believe that the contingency may develop. The plate market continues to be quiet with no offerings made. No car orders have been placed in this district during the past week.

Small Lots Cancelled

Cleveland, Jan. 22.—Some cancellations of plate tonnage, due for current delivery in this district, have been made owing to the inability of mills to obtain steel. These lots have not been large. In other cases makers have shown a disposition to compromise on higher priced contracts which call for 8 to 10-cent plates. It is expected that the prices will be about halved in certain cases. Some makers with whom orders have been less active of late report better specifications. Some shipments of destroyer plates with local mills have been held up by the enforced closing of these plants the past week. Prices locally quoted continue from 3.25c to 4c, mill. Universals still are being offered by eastern makers at 3.33c. mill. It is understood from Washington that the American Shipbuilding Co., which now is building many government boats, will receive orders for an additional number in the near future.

Mills Resume Rolling

Chicago, Jan. 22.—Exceptions to the closing order of the fuel administration have been made in the case of the leading interest and the leading independent to allow production of plates for government ship work, as well as other finished steel needed for war purposes. Plate mills accordingly started operation as soon as possible after the storm effects had been overcome and are producing this material as rapidly as circumstances will allow. Demand for plates continues strong but makers are unable to book tonnages except such as the government asks for its war work. Practically all the tonnage now being booked is preferential, under government orders.

Production is Handicapped

Philadelphia, Jan. 22.—The Emergency Fleet corporation continues to place new plate tonnage almost daily. Other demands for plates upon eastern mills are much quieter than in recent weeks. Eastern production of plates has been handicapped by lack of fuel and it has been impossible for the plants to take full advantage of their exemption from the fuel administration order.

Fuel Exemption

For Tin Plate Makers Fails to Prevent Some Shutdowns

Pittsburgh, Jan. 22.—Mills making tin plate for food containers for perishable foods last Sunday were exempted from the Garfield order and in consequence resumed operations where this was possible. Some mills have been closed down, however, on account of the fact that they have exhausted storage capacity where great quantities of tin plate have been piled up owing to inability to make shipments. The 30 mills of the American Sheet & Tin Plate Co. at Farrel, Pa., continued idle for this reason. The pressing need of supplying tin plate makers has also caused the fuel administration to exempt tin bar mills from the Garfield order.

Sell Scale and Cinder

Philadelphia, Jan. 21.—The annual buying movement in mill scale and cinder, practically has been concluded. Slightly higher prices on scale prevailed than last year, averaging between $6.50 and $7.50 per ton, delivered at consumers' plants.

Now Ask Cancelled Shapes

Fabricators Who Repudiated Contracts in East Willing to Take in Original Tonnage—Few Revocations Elsewhere

Philadelphia, Jan. 22.—Some fabricators who recently repudiated shape contracts for eastern mills now say they will take this material if it is delivered as first agreed. The situation that now arises is that these repudiations had caused a considerable derangement of mill schedules and some of the shapemakers now are devoting their capacity to the rolling of large shell rounds. Structural requirements of the local market remain light. The Phoenix Iron Co. recently took an order for 6000 tons for an extension to the Baldwin Locomotive Works, at Eddystone, Pa.

Extension Is Deferred

New York, Jan. 22.—Aside from government contracts, little new business has come before the New York structural market during the past few days. Practically nothing is being done in the way of new building. The E. W. Bliss Mfg. Co., Brooklyn, has withdrawn its inquiry for 5250 tons of steel for extensions. This action, it is understood, was due to a change in plans with regard to government work.

Market Is Quiet

Pittsburgh, Jan. 22.—Practically no business from private consumers are coming to fabricators. While some of them are unable to take additional tonnages, others are in a position to accept new business, but buying has been restrained on account of the high prices and also by reason of the fact that levels are subject to revision after April 1. The American Bridge Co. operated part of its plant during the five-day period when the Garfield order was in effect, the portion of it being exempt because the company is doing work for the Emergency Fleet corporation. This company has taken 1200 tons for a paper mill in West Virginia.

Western Fabricators Slack

Chicago, Jan. 22.—As a rule fabricating shops are not heavily burdened with work, though here and there an instance is found where a fair tonnage is on the books. Other shops would have practically nothing to engage their activities were it not for the material being fabricated for the Emergency Fleet corporation. Indications are this condition will continue well through the coming season. St. Louis and Milwaukee shops are an exception to this rule as each of these districts have much industrial work in progress calling for fabricated material. The general contract for Butler Bros. warehouse building, which will require 9000 tons of steel, has been let to John Griffiths & Sons Co., but the steel will be bought by the architects, Graham, Anderson, Probst & White, Chicago.

Western mills have not had cancellation of business contracted before prices were fixed in September, buyers filing specifications fully from month to month. Mills in this territory did not book much tonnage at the extreme premium prices, selling mostly for delivery at convenience at prices not much above the level established by the government. Production at present is exclusively on those contracts except the tonnage allotted by the government for war purposes.

CONTRACTS AWARDED

Extension to Baldwin Locomotive Works, Eddystone, Pa., 6000 tons, to Phoenix Iron Company.

Government nitrating plant, 8000 tons, to American Bridge Co.

Government building, 105 and 112, and range finding tower, 700 tons, to McClintic-Marshall Construction Co.

High school, Pipestone, Minn., 153 tons; general contract let, steel not bought.

Butler Bros. warehouse, Chicago, 9000 tons; general contract to John Griffiths & Sons Co.

Philadelphia Free Library, 2000 tons, to the American Bridge Co., by John Gill & Sons Co., general contractors.

A paper mill in West Virginia, 1200 tons to American Bridge Co.

Government power house, 2000 tons to McClintic-Marshall Co. by the J. G. White Engineering Corp.

Armory, Ninety-fifth street and Park avenue, New York, 250 tons to Passaic Structural Steel Co.

Government building in West Virginia, 300 tons to Eastern Steel Co.

Loading pier, Perth Amboy, N. J., 500 tons to T. A. Gillespie & Co.

CONTRACTS PENDING

Four buildings for the ordnance department at Baltimore and Atlanta, about 1000 tons, bids being taken this week.

Grand central viaduct, New York City, 300 to 400 tons, bids being taken.

Bridge for Lehigh Valley Railroad, 500 tons, bids being taken.

Chronic hospital, Brooklyn, 250 tons, bids being taken.

Bank building at Titusville, Pa., 200 tons, bids being taken.

Bridges and track scales for Pennsylvania railroad, 700 tons, bids being taken.

Pier No. 6, State barge canal, 350 tons, bids being taken.

Bridge work for Southern railroad, 500 tons, bids pending.

Eight signal corps buildings for American Expeditionary forces in France, 250 tons each. Bids opened Jan. 10.

State pier in East river New York City, 425 tons, bids being taken by I. Stander & Co., contractors.

Machine shop for E. W. Bliss Co., Brooklyn, 5250 tons, action deferred by change in plans.

Government buildings, 400 tons, bids being taken by J. G. White Engineering Corp.

Building for navy yard, Washington, 200 tons, bids being taken.

Equipment Buying

For Railroads by Government Still Awaited—4400 Cars Wanted

New York, Jan. 22.—Although demand for railroad equipment appears to be improving slightly, no large buying is anticipated until plans for financing the roads have been further developed.

Few car inquiries are before the market. The recent inquiry of the Baltimore & Ohio for 3000 freight cars has been withdrawn. There are, however, a number of inquiries out from private consumers, including the following: Brier Hill Iron & Coal Co., 10 gondolas, 40 coal cars and 25 general service cars; Equality Refining Co., Oklahoma City, Okla., thirty 8000-gallon tank cars; W. D. Jenkins, New Orleans, 10 tank cars; Samuel Baer, Nashville, Tenn., 10 tank cars; the Western Contracting Co., Kansas City, Mo., 25 tank cars; Lowell R. Gaidri, New Orleans, 10 tank cars; the Southern Oil Corp., Tulsa, Okla., 25 tank cars; the Jarecki Chemical Co., Cincinnati, six tank cars; and Earl Petty, Eldorado, Kans., 20 sulphuric acid tank cars. The war department is about to place orders for spare parts and specialties for freight cars.

The Republic Iron & Steel Co., placed orders for 200 coke cars with the Pressed Steel Car Co. The Colombian Northern has ordered six wooden gondolas from the American Car & Foundry Co. and the navy department several 60-ton steel underframe box cars with the same builder.

Among inquiries for locomotives are 50 for the Chicago, Milwaukee & St. Paul railroad and five for the Western Pacific railroad. The American Locomotive recently has taken the following orders: Fifteen Mikado locomotives for the Delaware, Lackawanna & Western; nine mountain types for the Rhodesian railways, and 20 Mikado locomotives for the Chilean State railways.

Rail Market Is Quiet

Pittsburgh, Jan. 22.—The market for standard rails is dull. The leading interest is not taking any business and is sold up for all of the present

year. A producer in the nearby district is understood to be in a position to take limited lots of standard and light sections. The government price of the latter is 3c, mill, while bessemer and open-hearth standard rail prices, for which levels have not been established by the government, appear to be quotable at around $55 and $57, mill, respectively. Some fair-sized tonnages of light rails have been sold by a maker in this district. The market for small spikes is fairly active and some jobbers are pressing producers for shipments, but railroad embargoes have made it impossible to deliver to some of them. The market for standard spikes is dull.

Government Wants Cars

Chicago, Jan. 21.—An inquiry for 4400 freight cars has just been put out by the government. Of these 4000 are of standard gage and 400 of narrow gage. It is not stated whether the larger cars are for domestic or foreign war use but probably the latter, as the narrow gage cars would be of use only on the light military railroads.

Chicago, Jan. 22.—Inquiry for standard steel rails and track fastenings is noticeably better in the west, for 1919 delivery. This is the best that can be offered by the Chicago mill unless conditions later in the year allow speeding up to a degree not now expected. In that case some additional tonnage might be sold for this year. Car buying is absent and no inquiry of any importance is now before the builders in the west.

Manganese Ore Retarded

Philadelphia, Jan. 22.—According to a cable received today, the Central Railroad of Brazil has embargoed, because of a lack of coal, all shipments of manganese ore from the state of Minas. This followed advices received five days ago that this road was only accepting 50 per cent of the normal shipments. As a result of this condition present imports of manganese ore to the United States will be made up entirely from stocks at Brazilian seaboard, estimated at from 60,000 to 100,000 tons. The manganese ore market is very strong. Sales of round tonnages have been made at $1.35 to $1.45 per unit at tidewater. The latter is the minimum figure.

Robert J. Anderson, formerly metallurgist, Cleveland Metal Products Co., Cleveland, was recently appointed engineer of tests of war materials, war department. Mr. Anderson has been assigned to the plant of the Brier Hill Steel Co., Youngstown, O.

Sheet Output is Cut Low

Fail to Get Exemption From Fuel Order and Industry is Resuming Gradually—Little Business Done

Pittsburgh, Jan. 22.—Operations of sheet mills in this district have been further curtailed and perhaps do not exceed 45 per cent of capacity. This is due to the shortage of steel and the transportation congestion. Sheet mills have not been exempted from the Garfield order and have been closed down altogether since last Friday, when the cessation became effective. The five-day period close down expires at midnight tonight, when the mills will resume running on the schedules that were maintained previous to last Friday. Mills have made their allotments for the first half for blue annealed and black sheets and for the first quarter for galvanized sheets and are not taking additional domestic business. Government requirements are heavy.

Mills Get Under Way

Youngstown, O., Jan. 23.—Valley sheet mills which have been suspended since last Friday are gradually getting under way again. A few mills were started at midnight Tuesday, while others did not start until late Wednesday morning. Domestic inquiry continues to come in, although the mills are booking light tonnages only. No government tonnages have been placed in this territory for some time, although nearly all mills have more or less of this business on their books. Foreign inquiry practically has disappeared. Sales managers state that since sound credit has been established by nearly all foreign buyers, their business is welcomed. However, in the past large tonnages of export sheets under sale were resold in this country on account of the difficulty experienced in obtaining permits for shipment of this material abroad. Strict railroad embargoes are still in force among the mills in this territory and at present include shipments west as well as east.

Export Inquiry Strong

Chicago, Jan. 22.—Strong demand for steel sheets for export continues to be the feature of the market here but makers are unable to book this business on account of the uncertainty of buyers being able to ship the material. It is necessary to obtain an export license, a priority order, railroad authority for shipment and a letter of credit. This makes it a complicated transaction. Additionally, most of the export demand is for prompt shipment. Some small lots are being sold by the leading independent for second quarter delivery, though the contracts allow cancellation in case prices are unsatisfactory to buyer or seller. This is unsatisfactory business and is kept down to a minimum.

Quiet Business

Shown By Jobbers, But This Not Due To Shutdowns

Boston, Jan. 19.—Business continues quiet with local jobbers in steel and iron products. Buyers working directly or indirectly on government work are the chief sources of business and since this class has been less disturbed by the Garfield order then those engaged on nonessential work, the shutdown cannot be blamed for the current lack of activity. It is believed warehouse business would be helped by a more extensive building campaign than is now possible with the government needing practically all the spare funds that are available. Prices being on the government basis, hold unchanged, but they probably would be firm if not actually strong in the face of current quietness, for supplies are not burdensome in any direction. Actually, most jobbers feel they are making quite a concession to the government in selling at the prices that have been fixed for them.

Restored Output

In Wire Products Still Matter of Uncertainty—Better Demand

Pittsburgh, Jan. 22.—Transportation conditions and the lack of fuel and of steel have greatly curtailed the output of wire and wire nails in this district, operations of some plants having been entirely suspended. There is no prospect that they will be able to return soon to anything like a normal schedule. Demand for both wire and wire nails is fairly brisk and some sales, involving considerable tonnages, have been made during the past week. The government has been placing fairly large orders for nails and commercial interests have been buying wire. Bessemer steel is being used by makers as much as possible in order to conserve open-hearth steel to meet the government demand.

Garfield Edict Brings Little Relief

Close of 5-Day Period of Industrial Suspension Finds Coal and Traffic Conditions Seriously Entangled—Washington Asserts Ships Are Getting Bunker Coal—Freezing Weather Hampers Railroads

GARFIELD'S order under which industrial activities were suspended for five days, failed to relieve coal and traffic conditions. Whether the fault rests with the wisdom of the order itself, or with the severe winter weather, is problematical. The fact remains that when the plants started up Wednesday morning in the territory from Boston to Chicago, the coal and railroad situation was as serious as when the shops closed down on Thursday of last week.

Washington states that ships have received bunker coal and are rapidly clearing for Europe with the freight which has been blocking eastern terminals. But reports from the east indicate that the confusion resulting from a multiplicity of federal agencies, each striving by its own method to clear the terminals and harbors, practically nullified all attempts to straighten out the tangle into which the eastern freight situation has become ensnarled.

St. Louis sees a visible improvement. Youngstown asserts some betterment resulted. The east finds little change, while Cleveland and Chicago awoke Wednesday to find the situation unimproved. Pittsburgh reports that railroads have cleared their main lines and hope now to disentangle the yard tie-ups.

Some manufacturers support the order as a necessary measure, others patriotically hope that some good has resulted to others if not to them, while many condemn the ruling as futile. An Ohio manufacturer of gun lathes lost two days before a belated exemption order was granted. In the full five days, this firm would have saved 200 tons of coal or $1000, would have burned 200 tons or $1000 in keeping the plant warm, and its employes would have lost $12,000 in wages. This manufacturer points out that the cost of any delay in making the gun lathes which are needed to turn out guns so that the American forces in France can finally be equipped with American artillery, can hardly be reduced to terms of $1000—the value of the coal saved.

Another firm which is producing one marine engine a day for the Emergency Fleet corporation, lost two days before the delayed exemption came. In those two days, about 40 tons of coal or $200 were saved—and 24 hours more were lost in outfitting two vessels which the country desperately needs.

Effect of Order in Leading Districts

WASHINGTON

Washington, at the close of the five coalless days, announces that ships were bunkered and the needs of public utility and domestic consumers greatly served. Mr. Garfield, however, has asked Railroad Director McAdoo to embargo for five days more all freight except food, fuel, munitions and essential supplies. Mr. McAdoo has declined, but may consent within a day or two to make the order. The Garfield request was inspired by the embargo announced Monday by the Pennsylvania railroad and would include the Reading and Baltimore & Ohio railroads.

Enough coal is on hand or in sight to bunker all ships now at seaboard, Mr. Garfield said Tuesday night. The ships which have sailed carried cargoes, which greatly relieved congested tidewater terminals.

How industry fared generally was not stated by Mr. Garfield, but he pointed out that industries, capital and labor patriotically co-operated in observing the order.

Various coal distribution plans will be considered by a commission named by McAdoo and Garfield. Mr. McAdoo named Howard Elliott and A. G. Gutheim, of the interstate commerce commission car service committee and Mr. Garfield named C. E. Lescher, coal statistician; G. N. Snider, traffic expert, and Samuel A. Taylor, technical expert, all of Garfield's own staff.

CHICAGO

At Chicago the railroads made every effort to clear their yards and transport fuel during the five days of enforced idleness, but conditions at steel plants were not materially improved.

Practically the entire manufacturing world in the Chicago district was idle for five days and the railroads were able to concentrate their energies on handling freight already in cars and yards without any additional loads being handed them. The yard blockades resulting from heavy snows were cleared up during the five days and the carriers generally were able to deliver cars to plants or to team tracks and to expedite unloading.

General fuel conditions are better and coal from Illinois and Indiana mines is coming in more freely. Plants using this coal are getting more fuel as the short hauls are being made much more easily now than a week ago, before the general shutdown.

PITTSBURGH

At Pittsburgh, the effects of the Garfield fuel order on traffic conditions are becoming apparent. At some iron and steel plants, however, congestion in yards has not been relieved and in instances is worse than it was before the order went into effect. Railroads have cleared their main lines to a considerable degree and this is believed to be a prelude to relieving the congestion in yards and to improving the movement of coal and coke to industrial plants. Some improvement in this movement has already appeared. The weather has been so severe that the efficiency of motive power has been reduced greatly and this has prevented much improvement.

In the Pittsburgh district, the effect of the Garfield order was lessened by the fact that the output in several branches of the iron and steel industry was either greatly curtailed or was altogether shut off through a lack of fuel and steel and because of the traffic congestion. Included in this category were wire, tin plate, sheet and bar mills.

The railroads are exerting vigorous efforts to relieve the congestion in this district, particularly at junction

points and terminals and in yards of industrial plants. The rivers are frozen, but nearly a score of steamboats are engaged in the Monongahela valley in breaking ice. At some points the ice is 20 inches or thicker and it is a serious question as to whether or not it can be broken up by this method.

NEW YORK

The end of the 5-day closing period finds coal terminals still badly congested. Less than 20,000 tons of coal arrived in New York City Tuesday, or less than for any one of 10 days preceding the Garfield edict. Coal shipments to tidewater railroad statistics show, have not increased. One bright spot in the situation is the improvement in bunker coal supplies to ships. Tuesday, 24 ships were coaled, including those most important to allies, but 81 still await coal.

Extreme cold weather and heavy snow in the eastern states is hampering the efforts of railroad authorities and the fuel administration to clear up traffic congestion. However, it is believed that the dropping of passenger trains and the decrease in new freight handling, due to the Garfield order, has laid the foundation for steadier and larger coal supplies to eastern plants and ports. Leading makers of pig iron and finished steel products say it is too soon to express an opinion as to how effective the closing order will prove in bettering industrial operations. In some quarters it is thought that the closing period should be extended. The situation is complicated by the fact that all shipments to New England points must be consigned to the government while all roads require shipping licenses and local embargoes are numerous. As yet, none of these embargoes has been lifted.

Interest in carrying out the fuel administrator's order, as it affected the large steel companies, centered at the office of Elbert H. Gary, chairman of the committee on iron and steel products of the American Iron and Steel institute, and chairman of the United States Steel Corp. Meetings to discuss the order and the consequent action to be taken were held both on Thursday and Friday at Judge Gary's office. Following adjournment of the Thursday meeting, Judge Gary issued the following statement:

"We shall probably not pay the wages of our men when they are not actually employed. To do so would be contrary to the custom of the trade and would establish a precedent that eventually would be unfair to the employer as well as to the employe."

YOUNGSTOWN

In the Youngstown district, coke, pig iron and steelmaking plants are operating at from 63 to 75 per cent of capacity. The Garfield order has not yet brought any decided improvement in transportation conditions, although most traffic managers say that the district is bound to be benefited in spite of the cold spell which prevailed during the suspension.

Many cars which had been sidetracked for two months or more were dug out of the jammed yards at East Youngstown while many remained untouched. It is reported that the New York Central railroad alone has 2000 cars waiting to be dispatched on to its main line, but that they cannot be moved owing to lack of motive power. The railroads promised to relieve the steel plants in this district of all loaded cars during the 5-day period, but in only a few instances were these promises carried out.

Carriage Cost Steep

THE unprecedented conditions and high costs prevailing today in connection with transportation is reflected by the experience of a Cleveland concern which recently sought to fill its requirements of 30 tons of chrome vanadium tool steel. This material was ordered forward by express and the carrier decreed it had to go in two cars. The shipment actually came in two refrigerator cars, consumed four days' time between a western Pennsylvania point and Cleveland and the express bill was approximately $600.

BOSTON

In Boston, present conditions hardly warrant the optimistic utterances from Washington that the industrial suspension has materially helped the traffic situation. The railroads have made some progress in relieving the car congestion, but the tracks are by no means clear. New England is still short of coal and much of the good that has come from the shutdown and from other measures may be undone by the heavy snowstorm now raging in that region. In Boston, the scarcity of coal is still acute.

Fuel administrator James J. Storrow also takes a rather gloomy view of the situation. He says that the 5-day closing order helped but did not remove the congestion, and asserts that favorable weather conditions are necessary to bring material relief to the industries affected.

Actually, tangible signs of material improvement in the situation are lacking. The railroad embargo, slapped on to help relieve the congestion, has not yet been lifted. Shipments of iron and steel consigned to government plants are coming through fairly satisfactorily.

DETROIT

At Detroit, the Detroit Edison Co. reported that the saving of fuel through curtailment of power amounted to about 25 per cent. The Garfield order, it is felt, did not produce the results sought for. Freight congestion has not been cleared up greatly and the saving in fuel was comparatively small. The order affected 250,000 industrial workers. Many specific exemptions were received by firms manufacturing war materials, one being the Ford Motor Co., employing 32,100 men. This company closed down last Thursday night at midnight and when notice of its exemption was received it was too late to recall the men so that the company has less than 1000 men at work.

BUFFALO

At Buffalo, due to the fact that all available car equipment is being utilized to carry coal to New England, as a result of a Garfield order of Jan. 7, diverting 80 per cent of Buffalo's supply, the city faces the gravest fuel crisis in its history. Even the 5-day closing order, tending to loosen traffic, was practically useless for all industries using coal exclusively.

Lack of cars forced the closing of the Rochester and Pittsburgh mines, Buffalo's big source of supply, and a chamber of commerce statement issued Tuesday says there must be a general closing down of industries within a few days unless the situation is relieved.

ST. LOUIS

In St. Louis, as a direct result of the Garfield order, the fuel situation is rapidly improving. In the past 24 hours, 642 cars of coal were brought across the Mississippi river, the best showing since the cold weather commenced. Railroad officials report a general loosening up, and at least two of the important western lines have cleared their tracks. In the big East Side yards, cars and even trains which had been embedded in what appeared to be a hopeless congestion, are being moved. Steel plants and industries generally on the East Side report increasing deliveries of all varieties of materials, especially fuel. They say they are receiving empties more promptly upon demand.

Contract Form

In Pig Iron Causes Thought Because of Revision Clause

Chicago, Jan. 22.—Changed conditions in the selling of pig iron resulting from the provision late in December that new contracts for delivery on or after April 1, 1918, must provide for revision in accordance with the government price in force at time of delivery, have caused much thought to be given to the form of contracts. In the past a pig iron contract has been absolute as to price and delivery, and not subject to revision no matter what course the market had taken between the time of selling and delivery. The new order of things changes this situation materially and gives rise to a number of contingencies. Many sellers have delayed execution of contracts until these could be provided for definitely. Makers are inclined to protect themselves by providing for cancellation if the announced price proves unsatisfactory to the buyer. One clause now under consideration is phrased as follows:

"The prices herein named are subject to revision by any authorized United States government agency in respect of any materials delivered hereunder after March 31, 1918, so that the prices on such delivery shall not exceed the maximum price then in force. It is understood, however, that should any tonnage be withheld, due to the failure of the buyer to accept it, such tonnage to be postponed and billed at the price in force for the period in which it was due."

One criticism of this form is that it seems to provide for revision downward "so that the price shall not exceed the maximum", does not provide for increasing the price in case the maximum is raised.

One maker is making contracts containing the following clause, which has seemed sufficient for the seller and is being accepted by the buyer:

"Above price is subject to change in the government schedule, buyer to pay any advance or receive the benefit of any decline. It is understood and agreed that if the ———— Co. is not satisfied with the price set by the government the said ———— Co. has the privilege of cancelling this order."

Another company proposes the following, which has not yet been adopted:

"Price net to furnace, subject to government revision in prices or if the government withdraws its price regulation on account of the discontinuance of the war or other cause the furnace is to receive the market price at the time of shipment, either upward or downward."

The latter covers a point that is not touched in other clauses. When the government terminates its supervision of prices, some contracts will be in force providing for payment at the fixed price. Makers perceive it

Reaffirm Copper Price

Washington, Jan. 23. (By wire.—The copper price has been reaffirmed at 23½ cents for all grades until June 1 on condition that wages be not reduced. The price is the same for allies, the public and the government.

Wants Iron Tonnage

New York, Jan. 23. (By wire.)—Considerable tonnage of second half foundry iron has been sold in this district subject to price revision.

The Worthington Pump & Machinery Corp. wants 7500 tons, mostly foundry, with some charcoal and some silveries.

Sales of 2000 to 3000 tons of English ferromanganese have been sold for first half at somewhat lower than the domestic price.

A middle western consumer wants 600 tons of ferromanganese and 800 to 1200 tons of spiegeleisen, for March-April-May delivery.

Brier Hill Steel Shows Heavy 1917 Earnings

Net earnings of the Brier Hill Steel Co. for 1917, after the usual charges and excess profits tax, aggregated $10,587,335. After payments of dividends—7 per cent on preferred and 6 per cent on common, as well as an extra on common of 14 per cent, the surplus as of Dec. 31 was $17,542,032. Net current assets at that date were $14,092,552. Gross business for 1917 approximated $51,000,000, and gross earnings about $24,000,000.

The Non-Ferrous Metals

Copper Lead Spelter Tin

New York, Jan. 22.—Owing to the clause in the fuel administration's closing order, exempting industries which must operate continuously, the smelting of non-ferrous metals was not interfered with seriously by the ruling. Mining of ores and smelting and refining of copper, lead, spelter and aluminum in the regions affected were generally continued. An exception to the copper industry was the Long Island refinery of the Nichols Copper Co., which was shut down by order of the local fuel administrator, who misinterpreted the order. If the order had thus generally been applied to the copper refineries, the loss of 13 days operations would have decreased output by about 110,000,000 pounds, which would have been serious indeed, in view of urgent munition requirements of this country and the allies, at a time when 75 per cent of the copper refined is being consumed in war supplies.

About 31 zinc producing companies were represented at the spelter meeting. No action was taken with regard to prime western and hopes of producers of this grade of spelter that something would be done to relieve their position were short lived. It now appears probable that the curtailment of prime western output will proceed more rapidly, as many smelters are operating at a loss of ½c to ¾c per pound. On the other hand, it developed that the government has taken large tonnages of high and intermediate grades of spelter, quietly. It has dealt directly with individual producers, instead of asking for bids. No price was made in many cases, the metal being taken with the understanding that both parties to the contracts would abide by the price to be fixed later by the war industries board. It is understood now that such a price has been fixed, both for high grade spelter and for sheet zinc. Announcement probably will be made by the war industries board this week. The spelter market has been dull and has changed little the past week. Quotations are about as follows: Prime western, prompt and January shipment, 7.70c to 7.80c, St. Louis; February, 7.80c to 7.85c; March, 7.85c to 7.90c; brass special, 8c to 8.25c; high grade, 11.50c to 12c, St. Louis.

Representatives of aluminum producing and manufacturing companies were scheduled to meet with the war industries board last Thursday, but this meeting is said to have been postponed for two weeks. The contract price of the Aluminum Co. of America remains 38c, for 1918 and 1919, No. 1 virgin ingot aluminum. The outside market has retained the strength of previous weeks, due rather to small supplies rather than heavy demand. Outside quotations follow: No. 1 virgin, 38c to 39c; No. 1 remelted, 37c to 38c; No. 12 alloy, 31c to 32c.

The tin situation has not changed on the surface since last week, nor in many weeks. Spot supplies have gradually disappeared, some extraordinary prices have been reported in some cases. One sale of 500 pounds of Straits tin is reported at $1.10 a pound. Several sales were made at around 96c to 98c for one and 2-ton lots.

Production of lead has been affected considerably by the labor, fuel and ore shortages in the west, but statistics are lacking to indicate just how much output has suffered. Little demand is evident in the outside market and probabilities are the government is taking increasing amounts, for prices are gradually strengthening. The American Smelting & Refining Co. continues to quote 6.75c, New York, while outside sellers are quoting 7.25c to 7.37½c, St. Louis, for prompt, January and February shipment. An advance by the leading interest is expected soon.

The antimony market is inactive, with prices unchanged at 14c to 14.25c, duty paid, New York, for spot Chinese and Japanese brands.

King George on the Clyde Inspecting the Harland & Wolff Shipyard

Two Years of State Control is Effective

BY JOSEPH HORTON

British Correspondent The Iron Trade Review.

THE control by the British government of the iron and steel industry took effect early in November, 1915. The trade thus has had a full two years' experience of these novel conditions, and the time is opportune for a review of the general results. We realize now much more fully than when the works were taken over, how urgent that step had become. During the first year after the outbreak of war, owing to the many dislocations caused, the output of steel was considerably reduced; but in July, 1915, when the large demands for shell steel came into sight, it became evident that steps would have to be taken to increase the output. The whole year, however, showed a considerable reduction in output, although not nearly as great as the reduction that took place in Germany over the same period. The output of iron ore for the second year showed a substantial reduction largely because 1200 miners had been sent into the army. Supplies of fuel and raw material were inadequate, labor was scarce and furnaces were running considerably below their capacity. In August of that year there were only 65 furnaces in blast in the whole of the north of England, the lowest total for many years. This represented a reduction of eight furnaces from the beginning of the year. This serious fall in output was due partly to the continuance of speculative conditions, which at times made production unprofitable and consequently discouraged it. The simple fact is that the blast furnace owners, faced by declines in demand and a scarcity of labor and raw material, had to save themselves from loss by the deliberate restriction of output, while in the labor field they had to make the hardest possible fight to prevent further depletion of the man power below the danger line. It is appalling to think what might have happened if that "Business as usual" policy which irritated our allies, had not been resolutely arrested by the act of focussing the entire steel business under one common supervision. In this matter America has profited by our mistakes and we are looking forward to the time when our friends from over the ocean will in their turn counterbalance the effect of these early deficiencies.

The following letter from Winston Churchill issued in the autumn is reproduced as evidence that the vast importance of steel is now fully realized. This letter was posted prominently in all the steelworks and has no doubt had a very good effect in stimulating the workpeople to do their best in this very important sphere of practical patriotism. The letter had to do in the first instance with the question of working during holidays.

Ministry of Munitions of War,
Whitehall Place, London S. W.,
10th September, 1917.

Gentlemen:

I am told that in some works in the steel trade there is an idea that the supply of steel and of all kinds of steel material is not a very urgent matter nor one directly connected with winning the war. My council have therefore asked me to write to you and point out how absolutely false and dangerous such a view would be.

It is in fact the exact reverse of the truth.

This is a steel war. The immense supplies which Germany has of steel and the way in which she has succeeded in grasping nearly all the steel centers of Europe is the principal cause of her being able to maintain the struggle. With the exception of our own country and northern Italy there is hardly a single important steel works which the Germans have not seized in this or previous wars; and but for the fact that the resources of America are to some extent available to us, the German steel output each year would largely exceed the whole production of the allies. The

foundation upon which all our chancse of victory stand is steel. The greatest possible quantities are required not only to hurl at the enemy in the form of shells, but to build the cargo ships vitally needed to replace those sunk by submarines and so safeguard us against famine and ruin.

Apart from these two paramount demands for steel there is a host of other prime necessities for the successful conduct of the war and for the maintenance of our industrial life. Railways, locomotives, wagons, lorries, plows and tools all depend on steel production. The ships which feed ourselves and our armies, the shells and guns our soldiers fire, the rifles they wield, the loopholes through which they fire, the revetments which uphold their trenches, the dugouts which afford them shelter and protection, the light railway lines that bring them food and ammunition all depend on iron and steel. Not only do we have we have with regard to the effect upon output was furnished by Dr. Addison, formerly of the ministry of munitions, in the house of commons, June 28 of this year. He stated that before the outbreak of war the output of steel in this country was about 1,000,000 tons a year. At the date when he spoke, it had been increased to nearly 10,000,000 tons and he said that he would be disappointed if it did not reach 12,000,000 tons at the end of 1918. According to the statistics of German production, it may be remarked here that in 1914 Germany's production of steel in metric tons was 14,975,106, and for the 10 months ending in October, 1917, the figure was 13,354,418 tons. If this average was maintained during the remaining two months, Germany's production in 1917 would be 16,035,000 tons of steel, so that, while England is still far behind Germany in production, our rate of progress is considerably more rapid. Dr. Addison said: "Steel produced from home ores except in the case of the rich ores of Cumberland was mainly the basic kind. To increase the use of home ores involved extensive rearrangement of blast and steel furnaces. A scheme has now come into operation and if it succeeds, by May, 1918, we shall have added to our production of basic steel from home areas by about 30 per cent within 14 months." Notwithstanding this increase the severe system of control over steel and the increased demand of the shipping and munitions programs offer no prospect of better supplies for private users. The process of fixing prices has been successful and notwithstanding the increased cost of material and labor steel plates in this country were less than half their cost in the United States, and shell steel was 30 per cent lower than in the United States."

Dr. Addison also said that spelter production would be doubled by the end of the year and we should be able to use Australian ore, which before was mainly under the control of German companies. The country was also able to produce sufficient tungsten to meet all the national requirements and to spare something for our allies. Among other things the department had supplied 1,500,000 steel helmets during the past six months. Dr. Addison anticipated that, if the war lasts, the country ought to find itself with a capacity for steel production more than 50 per cent greater than before the war.

There was a significant reference to the growth of the work of the department which had almost doubled within the last 12 months. Americans probably will have noticed how one additional product after another has been brought under the supervision of the ministry. The control began with pig iron, then extended to half-finished steel, to finished steel products, to scrap, high-speed steel and various other manufactures. Control obviously is a sort of slippery slope on which any halfway arrest is practically impossible. It is self evident that if half-finished steel is controlled steel scrap cannot be left out, in view of the very large extent to which such residuals can be utilized to replace billets, bars, etc.

A glance at the returns of selling

Maximum Prices on Rolled Steel and Scrap Products

PRICES, NET, AT WORKS FOR HOME CONSUMPTION ONLY

	Joists	Rails, 60 lbs.	Rails, 50 to 60 lbs.	Sheet and tin plate bars	Blooms and billets (ordinary)	Blooms and billets (special)	Steel scrap heavy melting	Steel scrap crucible use	Steel turnings and borings	Steel turnings and borings, special short ext. heavy	Higher high tensile steel plates 10 lbs. thick and up	Higher high tensile steel angles 7 in. and over
Pre-maximum prices	$53.40	$52.80	$53.46	$60.00	$60.00	$62.40	$24.00	$25.20	.....	.....	.....	.....
Apr. 7, 1916..	53.40	52.20	.....	49.80	49.80	52.80	.....	.....	.....	.....	.....	.....
July 7, 1916..	53.40	52.20	.....	49.80	49.80	52.80	26.40	.....	$13.20	.....	.....	.....
Nov. 1, 1916..	53.40	52.20	52.80	49.80	49.80	52.80	26.40	27.60	13.20	$18.00	*$105.60	100.80
Jan. 1, 1917..	.....	.....	.....	.....	.....	.....	25.20	.....	12.00	16.80	.....	100.80
Jan. 5, 1917..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100.80
Aug. 28, 1917..	.....	.....	.....	.....	.....	.....	25.20	.....	16.80	.....	.....	.....

*Per net ton f. o. b. maker's works.

	Ship, bridge and tank plates	Ship, bridge and tank plates ¼ to ⅞-in.	S. M. boiler plates	Steel angles and bulb angles	Steel angles 6 to 4 in.	Steel angles 4 to 3 in.	Steel angles 3 to 2 in.	Steel rounds squares and hexagons, 3 to 5½ in. without tests	Steel rounds squares and hexagons 3 to 5 in. with tests	Small steel rounds squares and hexagons 3 to ¾ in. without tests	Small steel rounds, squares and hexagons, 3 to ¾ in. with tests
Pre-maximum prices	$55.20	$69.60	$57.60	$53.40	$67.80	$70.20	$72.60	.....	.....	.....	.....
Apr. 7, 1916.	55.20	69.60	60.00	.....	.....	.....	.....	.....	.....	.....	.....
July 7, 1916.	55.20	69.60	60.00	53.40	.....	.....	.....	60.00	.....	.....	.....
Nov. 1, 1916.	55.20	69.60	60.00	53.40	67.20	69.60	72.00	60.00	62.40	72.00	74.40

to supply ourselves but we have largely to aid our allies particularly the French who were robbed of their best steel works at the first German onslaught.

Steel is not only our principal means of war, but it is our best chance of saving the lives of our soldiers. This is a war of machinery; and generalship consists in using machinery instead of flesh and blood to achieve the purposes of strategy and tactics. Every man or manager who is engaged in steel production is directly engaged in smiting down the enemy and bringing the war to a speedy close. And although he may not share the perils and sufferings of the fighting troops he can win for himself the right to share their honor when victory is attained.

You are at liberty to post this letter if you think it useful in any portion of your works and I urge you to impress the facts to which it refers upon all helpers in the cause.

Your obedient servant,
Winston S. Churchill.

The latest authoritative statement

prices and wages under the midland iron and steel wages board shows that although selling prices are very high compared with those of Germany, yet a very effective arrest has been obtained. A year ago there was a rise in the average selling price between November and December of 1915, and July and August, 1916, from £11 4s 4d ($53.84) to £14 2s 2d ($67.72). Between the latter period and July and August this year, the last period for which returns are furnished, the advance has only been up to £15 5s 9d ($73.98), a very marked reduction in the upward movement imposing a restraint on wages very greatly

ing the war it will be realized that an arrest in this upward progress is much desired.

Not only does the control of iron and steel production extend in area taking in additional products, but it appears every week to increase in intensity. Official restraints are becoming more rigid in many directions. It has been found in the midlands that some manufacturers have sought to over-requisition raw material ostensibly for war work, while making use of the surplus in other departments of their business. That appears to have happened only to a trifling degree in the steel trade and has

ous government departments concerned in these matters are practical men. Some of the most familiar figures for many years on the Birmingham, Glasgow and Middlesbrough exchanges are to be found holding offices of authority in the steel and kindred departments of the ministry of munitions. The controller is a practical steelmaker with a full inside knowledge of the iron and steel trades. The other officials have had to do for many years with steel supplies either to the admiralty or some other steel consuming department. The assistant director of materials for the admiralty had for many years

Men Who Direct Control of British Iron and Steel Industry

COL. R. S. HORNE, K. C.
Director of Materials and Priority for the Controllers Department, Admiralty

JOHN ROGERS,
Assistant Director of Materials and Priority for the Controllers Department, Admiralty

SIR JOHN HUNTER
Head of Steel Production in Great Britain, Ministry of Munitions

desired by the ironmasters. The advances secured by the men during the 12 months ended August last were only 12½ per cent, a material reduction compared with the previous year. The last bimonthly return covering July and August shows an actual fall in values in the two months from £15 6s ($74.04) to £15 5s 9d ($73.98), being the average selling price obtained by the 17 selected firms whose returns are the basis for wage settlements. This is the first fall since the war began, and though the amount is slight employers are thankful for small mercies in view of the mischievous effects of the extravagant earnings of the workpeople. The advances in the north of England are about similar and as the workmen in that district have had their wages lifted 67½ per cent dur-

been much more manifest in the nonferrous metal department. However, a system of rationing has been introduced and the control now is so complete through the comprehensive documents circulated that the government practically knows of every order turned out of the mills.

Practical Men in Saddle

All these revolutionary changes have been carried out with a minimum of friction and the relations between the departments, the iron and steel masters and their managers are as cordial as they can be, a fact which has been largely due to the loyal and patriotic anxiety of both employers and workmen to expedite and increase the output by every means in their power. It is due also to the fact that the heads of the vari-

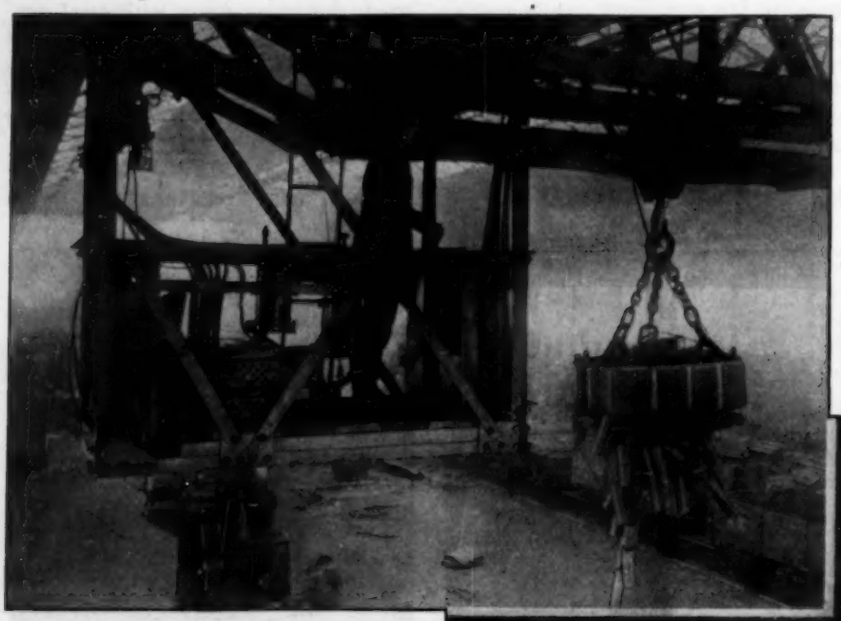
been looking after steel supplies on behalf of the department. This practical knowledge on the part of the officials commands confidence, and has facilitated and stimulated production. The chiefs know from long experience what can be done by certain mills. Orders are grouped with the object of minimizing roll changes, and the avoiding of stoppages for the purpose of turning on to small parcels. Practical knowledge has also done a great deal in the direction of standardizing to the fullest possible extent. Figures, of course, must not be given, but it has been found possible to reduce enormously the number of sections of angles, tees, zees, etc., used in shipbuilding, a most important branch of economy.

A personal difficulty presented itself rather early in the necessity of in-

creasing the amount of inspection which had to be done. This difficulty was overcome largely by the combination of forces between Lloyds, the admiralty steel department, and the department devoted to the supply of steel for munitions. The inspection was reduced by restricting it to samples instead of going into detailed examinations.

The introduction of the human element occasionally is made manifest by the receipt by some manager of a letter of appreciation recognizing exceptional services in the effort to increase production and to meet the urgent needs of the moment. The mills of the country are working in absolute harmony with the offices of the steel controller and putting the whole of their resources at the disposal of the authorities. There is a very good system of decentralization under which a steel superintendent is appointed in each district who practically controls the whole of the firms in his district for the admiralty steel department and the ministry of munitions. The first named department has to take cognizance of steel supplies not only for warship building but also for mercantile shipping which in these days of submarine activity has become so important. Fortunately the matter has been simplified by the fact that in the early days of the war the supply of shell steel was tackled in earnest, after the necessity was really understood. In commenting on this feature Dr. Addison said:

"For a long time the output of explosives was in advance of the output of shells and other forms of ammunition, but during the last few months the one has been balanced with the other and production adjusted accordingly. In March, 1917, the capacity for the production of high explosives was more than four times that of March, 1916, and 28 times as great as that of March, 1915. The great national projectile factories for the production of heavier natures of shell had been in full operation during the year and produced in March exactly one-third of the total output of heavy shells. They recently reached such a state of production that they were able to divert certain of the national factories in whole or in part to assisting other sections of the munition program."



A NEW CRANE OPERATOR

It was because the shell question was tackled some time ago that such excellent progress is now possible in the application of steel to shipbuilding requirements, a development in fact constituting one of the most hopeful features in connection with the present prosecution of the war.

As Dr. Addison suggested, there has been every encouragement for production to maximum capacity, and the control officers have been able to give useful hints in this direction. A large number of new mills have been erected and additional furnaces built. This extension is constantly in progress with the result already indicated. Economy has been effected also by the much larger substitution of scrap for pig iron in the production of steel. Here again figures must not be used but it is common knowledge that the shortage of pig iron has been largely overcome by the skillful use of scrap.

The same knowledge has been employed in relieving the scarcity of basic material and the energies of officials have been exerted for some time past in the diversion of furnaces, which used hematite in making ordinary forge and foundry material, to the production of basic iron for which such a great demand exists. Fortunately, recent discoveries of iron ore promise greatly to assist this branch of the industry. But the more complete and efficient working of ore beds known to exist is of much more importance. Arrangements are being made at the present time for the exploitation on a large scale of a most valuable ore bed in the neighborhood of Banbury, estimated to contain 50,000,000 tons of ore. Four of the largest firms in the kingdom are arranging to work this ore.

Courtesy of Ministry of Munitions.

WOMEN DOING THE ARDUOUS WORK OF FILLING BUGGIES WITH ORE AT AN ENGLISH BLAST FURNACE

One of the awkward tasks falling to the lot of the ministry in determin-

ing priority has been the selection for execution of orders from among the applicants for steel not strictly definable as war steel. The maintenance of the railways is a good example, and this difficulty has been met by the presentation on behalf of the railways of a schedule representing their minimum requirements for the purpose of maintaining operation. It is evident that when the war ends the railway renewal program for great Britain will reach gigantic dimensions. For the present they have to be satisfied merely to "carry on" and it has been found possible to meet the inventory of tonnage required for the maintenance of the various lines. As the railways also are controlled the problem has been somewhat simplified, as it has enabled the steel department to deal with a representative body instead of a number of rival lines. The commercial work, generally, is pretty well at a standstill.

A certain amount of economy has been found possible in the department of transit and transport. The whole area has been divided into three or four large distributing centers comprising Glasgow, the northeast coast, South Wales and the midlands. As far as possible each district has been made self-contained, and every effort is made to avoid the needless transportation of material from one manufacturing center to a consuming center in another part of the kingdom. This has been carried through successfully in almost every instance.

An exception will have to be made to the story of cordial relations as far as merchants are concerned. Merchants appear to have been more or less crowded out of the government scheme of operation and such friction as has arisen has occurred in this department. It perhaps was inevitable that a system which deals directly with manufacturers in some degree should ignore merchants, and one of the results of government control has been the formation of large associations of merchants for the purpose of looking after their interests now and after the war. It seems a pity that a larger number of iron and steel merchants did not place their comprehensive technical knowledge at the disposal of the government in one or another of the iron and steel control departments. The lot of the merchant has not been a happy one, as much of his time is being devoted to efforts to obtain from the department supplies of steel for commercial purposes. On the other hand, he has had to endeavor by hook or by crook to maintain friendly relations with dissatisfied customers. Great offense was given some time ago by an article in The Times in which some short-sighted writer referred to the merchants as "parasites". No government official ever used this offensive term, but certain merchants have saddled the ministry with the responsibility for the epithet. No doubt the merchants eventually will get back to his old place and will take his share of the greatly enlarged business that will follow the war.

WOMAN DRIVING STEAM HAMMER

Courtesy of Ministry of Munitions.

SANDING PIG BEDS—ONE OF THE MORE STRENUOUS WAR TASKS WOMEN HAVE UNDERTAKEN

The story of the steel control department would be incomplete without some notice of the enormous contribution made by women workers. This has been one of the surprises of the war and the part played in the heavy trades by the women has astonished everyone. Some idea of their labors may be gathered from the photographs accompanying this article presented through the courtesy of the ministry of munitions, which has devoted itself especially to the employment of women and which is described as the D. A. dilution section. The last issue of the Board of Trade Labor Gazette tabulates 1,500,000 new women workers of which it is said 670,000 are employed on munitions and 632,000 engaged on other government work, such as the manufacture of clothing and food for the troops. Roughly speaking, the trades

connected more or less directly with iron and steel and munitions, which include the very important branch of engineering, employ about 1,000,000 women, of whom at least 800,000 have come in specially for the war. The D. A. dilution section recently has given exhibitions showing photographs of the women at work, and the exhibition certainly revealed a sort of new industrial world.

American visitors to Belgium years ago in connection with Iron and Steel institute meetings were astonished at the employment of women in blast furnaces, and iron and steel works. We have out-Belgianed Belgium in this respect, and women are at work in blast furnaces and steel works, bolt and nut works, foundries, metal mills, forges, etc. In blast furnaces and steel works women are to be seen attending frost fires, breaking billets, breaking limestone, coke, slag, etc., discharging coal, ashes and cinders, driving electric cranes, loading slag and ore barrows, wheeling bricks, operating circular saws, sanding pig beds, etc. The women have been successful in the foundry and they have been efficient molders, grinders, fettlers, sand blasters, etc. In the iron and steel mills a great deal of the engine driving is done by women and they transport materials in and out of the foundry, assisting and charging at the furnaces, for example two women assisting one man in the charging of a 300-pound bloom, piling scrap, operating shears, cold saws, etc. It has been found possible to put the women in complete charge of power houses involving the starting and stopping of motors, looking after pumps, cleaning plant, etc. Similarly with galvanizing shops the women discharge practically all the duties satisfactorily, but it is a little startling to find them hooking on at a cogging mill and charging and putting off in a reducing mill. They work successfully in assisting with heat treatment of steel forgings, grinding forgings, operating drop hammers, steam hammers, hydraulic presses, punching sleepers and in general manual work.

Show Remarkable Aptitude

The endurance and nerve manifested by the women has surprised everybody, while their aptness in acquiring processes for which they have had no sort of preparation prior to the war, has satisfied those responsible for the arrangements. It is a revelation to see women manipulating the lathes devoted to the production of big shells where they show unexpected aptitude for such highly skilled operations as welding, heat treatment, etc. They are equally successful also with the setting of the tool in connection with various engineering employments.

A good example of the nerve of one woman engineer is cited. She was in charge of a large centrifugal engine when she had the misfortune to drop her key into the engine pit. She discovered her loss only when the machine began racing. The engine was a sufficiently formidable one to manage at ordinary times. She, however, had the courage to descend into the pit and to recover the key which enabled her to slow down the machine. Another story relates to the patriotism manifested by two

Finished Iron Prices

MAXIMUM PRICES, NET, AT WORKS FOR HOME CONSUMPTION ONLY

	Marked bars South Staffordshire	Common bars South Staffordshire	South Yorkshire bar iron	North of England bar iron	Lancashire bar iron	Heavy wrgt. iron scrap ¾-in. thick and over includ'g horseshoes	'H'vy wrgt. iron scrap ¼-in. thick and ov. includ'g heavy country wrgt. iron scrap
Pre-maximum prices	$72.00	$64.80	$67.20	$64.80	$67.20	.....	.....
Apr. 7, 1916.....	*72.00	†66.00	†66.00	66.00	66.00	.....	.....
July 7, 1916.....	72.00	66.00	.....	.....	.....	.....	.....
Aug. 15, 1916.....	74.40	.....	.....	.....	.....	.....	.....
Nov. 1, 1916.....	74.40	66.00	66.00	66.00	66.00	.....	.....
Mar. 22, 1917.....	.....	.....	.....	.....	.....	27.60	25.20
Aug. 28, 1917.....	.....	.....	.....	.....	.....	30.00	30.00

*Less 2½ per cent maker's works.
†Net f. o. b. maker's works.
Fixed prices do not apply to sections rolled by works which buy blooms, billets or puddled bars in the open market.

Maximum Prices of Pig Iron

PRICES, NET, AT FURNACES FOR HOME CONSUMPTION ONLY

	Cleveland No. 1, 2 and 3	East coast Hematite, No. 1, 2 and 3	Scottish Hematite, No. 1, 2 and 3	Welsh Hematite, No. 1, 2 and 3	West coast Hematite, No. 1, 2 and 3	Derbyshire forge	Derbyshire foundry	Lincolnshire basic or foundry	Northamptonshire No. 4 forge
Pre-maximum prices	$22.20	$30.00	$28.20	$36.00	$30.60	$21.60	$22.20	$22.20	$20.64
Apr. 7, 1916..	19.80	29.40	29.40	29.40	30.60	20.40	22.20	21.00	19.80
July 7, 1916..	21.96	29.40	29.40	29.40	30.60	20.40	22.20	21.00	19.80
Aug. 15, 1916..	.....	.....	.....	.....	.....	.....	.....	22.20	21.00
Nov. 1, 1916..	21.96	29.40	29.40	29.40	30.60	21.60	22.20	22.20	21.00

	Northamptonshire No. 4 foundry	North Staffordshire forge No. 4	North Staffordshire foundry	South Staffordshire Shropshire and Worcestershire time forge	South Staffordshire Shropshire and Worcestershire part time foundry	Common Staffordshire	Staffordshire cold blast	Scottish foundry and forge Monkland, Dalmellington, Eglinton and Govan
Pre-maximum prices.....	$21.00	$21.60	$22.20	$21.60	$22.20	$20.40	$40.80	.....
Apr. 7, 1916.	20.64	21.60	22.20	21.60	22.20	20.40	42.60	.....
July 7, 1916.	20.40	21.60	22.20	21.60	22.20	.....	42.60	$27.36
Aug. 15, 1916.	21.36	22.80	23.40	22.80	23.40	21.60	43.80	.....
Nov. 1, 1916.	21.36	22.80	23.40	22.80	23.40	21.60	43.80	.....

High Speed Tool Steel Prices

MAXIMUM PRICES, NET, AT WORKS FOR HOME CONSUMPTION ONLY

	Finished bars 14 per cent tungsten	Finished bars 18 per cent tungsten	Finished rounds and squares 3 to 8 in. inclusive	Extras rounds and squares ½ to ¼-in.	Extras Flats under 1x¾ to ½ x ¼-in.‡	Extras bevels of approved sizes and sections	Extras bars cut to length	Scrap iron high speed tool steel millings and turnings	Scrap bar ends
Pre-maximum prices.....	$0.72	$0.90	†	†	$0.06	$0.12	12	§	$0.08
Apr. 7, 1916...	.68	.92	...	...	...	...	...	...	...
July 7, 1916...	.68	.92	...	...	...	...	...	.10	.12
Aug. 15, 1916...	...	...	...	...	...	...	...	*.10	*.12
Nov. 1, 1916...	.68	.92	.08	.06	.06	.12	10	.10	.12

*Both net delivered consumers' works.
†Charged by some makers only.
‡And all sizes over four times in width over thickness.
§Not sold.

women workers who had managed to get at cross-purposes with the management and had given in their notices. The factory in question was producing explosives and as the result of the visit of hostile aircraft, a certain amount of damage was sustained. The next morning these two women came to the management and asked to be allowed to withdraw their notices, which they handed in on the day previous to that of the air raid as they considered the time was not opportune for them to desert their posts. It is believed that this represents the loyal and patriotic spirit in which thousands of women have entered steel works and ammunition factories. It has been found possible to utilize their services very largely in scientific and laboratory work, and useful contributions have been made in the research field.

The training of the women has been different to that ordinarily adopted with apprentices and male assistants who have to be turned loose into the shop to receive just enough instruction to enable them to do their daily work. That system has been condemned as lacking thoroughness and as tending to develop a great deal of habit which has to be unlearned. The only way to make women useful has been to teach them one operation after another and for this purpose a number of training schools have been established at which the women are carefully taught each single operation. Usually they pick up the job in a few days or weeks, and where the highest possible accuracy is called for, in a few months. While the range of their knowledge is limited, it is at all events thorough. These women have been drafted in from domestic service, shops, dressmaking establishments, etc. Wherever possible the size of the tools has been reduced to bring it within the smaller capacity of the woman worker. It is a question how many of these will prefer to remain in workshops after the war providing they have the opportunity to do so; but it is believed that the majority will go back to their former employment.

Another problematical question relates to the permanent effect of control which must remain after the war. England will of course have an enormously larger steel output and capacity. The government will desire that capacity to be maintained if only as a means of protection against our enemies, and there is a general belief here that some form of fiscal protection will be introduced in order to prevent the dumping of foreign steel to the injury of the British manufacturer. There will be a natural desire on the part of the steelmaker to recover the full control of the works on the old system, but it is recognized that unless there is to be chaos and confusion state control will have to be withdrawn gradually. It is believed that the immense demand for steel for all sorts of purposes must prevent unemployment for a long time to come. The industry will benefit from the fact that the new plants laid down are most modern and electrical driving has been introduced to a degree almost involving a mechanical revolution.

In no branch of industry has there been less friction than among iron and steel workers. This is due mainly to the fact that wages have been regulated by the northern and midland wages boards, while every effort with the co-operation of the ministry of labor, where this has been found necessary, has been made to deal with the wages of these workmen not governed by the scale. The trade undoubtedly has benefited from the coincidence that John Hodge, the minister of labor, who has all along commanded widespread confidence from men of all classes and parties happens to be a well known leader of the steel trade.

One of the collateral results of the control has been to bring about a more nearly complete combination of iron associations in all districts. A series of conferences have been held at which the following associations have taken part, namely the Lancashire Bar Manufacturers' association, Northeast Coast Bar Makers' association, South Staffordshire Iron Masters' association, Scottish Bar Iron Manufacturers' association, South Yorkshire Bar Iron association, and "Best" Yorkshire Iron Makers' association. Various sections of the iron trade thus have been brought into closer combination than ever before, and this joint action certainly will be maintained in a large way after the coming of peace.

Metric System

Urged at Scientific Meeting at Pittsburgh—Is Used by Japanese

Universal adoption of the metric system as a means of measurement was urged by George F. Kunz, New York, president of the American Metric association, in a paper he read on Saturday, Dec. 29, at the convention in Pittsburgh of the American association for Advancement of Science. Mr. Kunz pointed out that the metric system will have to be employed in the reconstruction of Europe.

Mr. Kunz spoke briefly of trade schools in this country and Germany. He conceded that Germany's trade school system was wonderful, but declared there is no trade school in the world that is the equal of the Carnegie Institute of Technology, Pittsburgh.

Dr. Shigetaro Kawasaki, chief geologist of Korea, stated that in Japan and Korea a theoretically correct system of mensuration is employed, but it is complicated.

"It has been employed among the Japanese and Koreans for a very long time," he said, "and it is still a national mensuration system. But with the coming of European civilization," he continued, "the metric system was imported into Japan among other innovations and was partly adopted by the Japanese because of its simplicity and exactness. At present the metric system is employed in Japan in military and naval affairs and is also used by men of science. I am of the opinion that because of the growth of international commerce, the use of the metric system will increase considerably in the future."

Producing Magnesium at Niagara Falls Plant

Prior to the war practically all of the magnesium used in the United States was imported from Germany, but since the stocks in this country were exceedingly small, it practically disappeared from the market in less than 12 months. The price reflected its extreme scarcity. In January, 1917, the American Magnesium Corp. was organized at Niagara Falls, N. Y., for the purpose of building a plant for the manufacture of magnesium and magnesium alloys. These works now are in operation and are producing this metal in such large quantities that the price has been greatly reduced and is rapidly approaching the prevailing quotations before the war.

The principal uses for magnesium are for alloying with aluminum for airplane parts where lightness is essential. By the proper combination of magnesium, aluminum, and other metals in small quantities, an alloy can be produced, which will reduce the weight to nearly one-half that of No. 12 aluminum. Magnesium also is being employed more extensively as a deoxidizer and a scavenger for copper, brass and bronze, and the American Magnesium Corp. has introduced a new magnesium alloy designed particularly for use as a deoxidizer for tool and alloy steels.

Creating the Cripple's Opportunity

The Problem of the Cripple in Industry and as a By-Product of the War Now Confronts the Engineer—Its Solution Points to a Change in Vocational Education

BY FRANK B. GILBRETH AND L. M. GILBRETH

THE purpose of this paper is to report progress in the solution of the problem of training the crippled soldier, and the part that the engineer should take in the work. Certain conclusions may be drawn from the work at this time and they are briefly stated as follows: The crippled soldier problem is identical with the problem of the cripple in general, and in the solution of this double problem lies a new type of education. The solution will be based on finding one best way to do work and the adequate assignment to work. The engineer is best fitted to determine the one best way to do work, to formulate its methods and to supply the necessary devices and mechanical appliances.

All cripples, no matter what the cause of the crippling, require a training that will be mentally satisfying and physically beneficial. This training must be such as will enable them to become productive members of the community, and to remain on the world's payroll. This implies either competing with non-crippled workers in occupations open to all, or setting aside certain work for crippled workers exclusively, or both. It implies discovering and making available opportunities for crippled workers, discovering which cripple is best fitted to utilize the opportunity, and training him to make the best possible use of it. It also implies not only opportunities for individual development, but such social opportunities as will enable the cripple to fit back into the ordinary social life with the greatest ease and the largest amount of durable satisfaction.

Those crippled in war furnish a small percentage of the total crippled as compared with those crippled from other causes, such as disease and accidents, especially in the industries. This is true even in Canada, which has furnished such a remarkable quota of fighting men in comparison with the total number of her population.

The solution of the crippled soldier problem as outlined consists of a type of education that is new in that it eliminates the greatest amount of waste possible in the educational process. It teaches the one best way at the outset, instead of following the old practice of "learn every way", with the vague hope of arriving at efficiency as an outcome. It enables the learner to arrive at a desired outcome with the greatest amount of speed and the least amount of effort, and with the largest return in efficiency and resulting satisfaction.

Because of those qualities, this new education is bound to be used in the future not only in the re-education of cripples in what is to be their new life work, but in education in general. Just as the Montessori method of teaching children, which originated in an effort to discover the best method of training subnormals, proved so successful in that field and demonstrated such underlying principles of general applicability that it now occupies an important place in the training of normal and supernormal children, so this new method of education, discovered as a result of synthesizing measurements of champion workers in the quest of the one best way to do work, is spreading, through the general interest in re-educating military cripples to the re-education of all cripples, into the manual training schools, corporation schools and the general educational fields.

The new education has two parts—the discovering of the one best way to do work, and the testing of the individual and placing him at the demonstrated most efficient work. By work is meant activity of any kind, whether physical or mental, for the investigations and the resulting methods are being made and applied in both mental and physical fields of activity.

There is little argument as to the desirability of finding the one best way to do anything, regardless of whether it is immediately learned, taught or habitually practiced. There has been considerable discussion as to the possibility of finding it, if it does exist. The important thing is that there is one best available way, as has been demonstrated in both theory and practice. This way seldom if ever exists in the consecutive motion cycle units of any one individual, though their units may be in general use, and many will undoubtedly be used by every expert in the activity.

In the matter of tests and assigning individuals at the most appropriate work for them, it is demonstrated that the discovery of the one best way of doing the work and the consequent standardization of the best methods and equipment will allow of tests that are made more adequate. For this reason, if a test can be made of the proposed worker with the method and device that it is planned he shall use, there will be fewer variables in the testing process, less difficulty in the valuation of the tests and fewer necessary transfers.

The extent of the cripple problem is practically unlimited. When we come to consider the subject closely we see that every one of us is in some degree a cripple, either through being actually maimed or through having some power or faculty which has not been developed or used to

Repairing Human Wrecks

THAT same ingenuity which has enabled American engineers to bend the inanimate forces of steam and electricity to the uses of mankind is now called upon to set to work the latent powers of men crippled in war and industry. Whether it be by a boche bomb or crushing shop wreckage that a cripple is produced, repairing the damage and overcoming the mental depression incident thereto, is a problem for the engineer. Nature compensates to a great degree for that which is destroyed. The blind sometimes hear with unusual acuteness, and the perceptions of the deaf quicken to the ability to read lip language. To find those compensating abilities, to supplement lost members and to repair human wrecks to the point of further world service is the work outlined and explained by Mr. Gilbreth in this article.

From a paper read at the annual meeting of the American Society of Mechanical Engineers, December, 1916. The authors are specialists in industrial management, motion study and labor problems.

its fullest extent. The degree of crippling extends from the worker who, through some accident, has lost his eyesight, his hearing, and the use of his legs, arms and hands except for the use of one finger (and by the way this is no imaginary illustration, as we have lately received a skillfully woven bag made by such a cripple maimed through a mining accident) to a man who is dependent upon glasses for reading. From an efficiency standpoint a policeman with corns on the soles of his feet or a golfer with the gout in his toe is more of a cripple during his working hours than a legless man while operating on a typewriter. We can, then, think of every member of the community as having been a cripple, as being a cripple, or as a potential cripple. Conversely, we can think of a badly mutilated man as not being a cripple during the period that he is at that work the performance of which is not affected by the mutilation.

The problem of the cripple is a problem of education. With the present state of the art of teaching it is largely a problem of re-education, since most of us, noncrippled as well as crippled, have received the wrong type of education and must be re-educated even in the fundamentals. As education becomes more scientific the problems of re-education will become simplified and the processes will become shortened.

A government bureau for collecting and conserving all data will come naturally as a development of the activity in other fields and of the present activity of various government departments along various lines. This bureau should contain a museum that would include among its exhibits models of artificial limbs and appliances for cripples. This, supplemented by state and municipal museums along similar lines would bring first-hand knowledge to the cripple, who too often buys the first artificial limb that he sees, and usually averages three or four purchases before he gets the one best suited to him. Such a national museum should also contain fatigue- eliminating devices, which would enable all workers to become more productive with less accompanying fatigue. The writers first called attention to this need in 1910, feeling that fatigue study, like accident prevention, is a function of the engineer.

The Case of the Crippled Soldier

The crippled soldier is at a disadvantage as compared with the industrial cripple, in that he is often at a distance from aid of various kinds at the time the crippling takes place, and thus misses the chance for the early re-education that is desirable and necessary. Further, through mistaken kindness the crippled soldier is not taught work of any kind during his convalescence and during the period immediately after his return home. In fact, he is often encouraged by misguided friends to remain idle until the possibility of teaching the maimed member and the mind that has stopped learning has decreased, and re-education becomes more difficult if not actually impossible. Another handicap to the crippled soldier is the terrible physical and mental anguish that often precedes as well as follows the crippling.

The crippled soldier has the advantage over the industrial cripple in many regards. He is the object of great interest and patriotic sympathy, therefore is a member of the community to be courted rather than shunned. He suffers in the limelight, and therefore is practically assured of assistance as soon as the world is convinced as to what he needs. He will have, if he has not now, expert training at his disposal. He has the consolation of fame and of having done something worth while, even though he had to pay the penalty of being crippled for having done it.

For these reasons it is advisable that the engineer turn his attention immediately to the problem of the crippled soldier, supplying the new education in the form of re-education for this soldier, with the assurance that when the methods and devices have been supplied the industrial and other cripples will benefit exactly as will the crippled soldier.

The engineer's part in adapting methods and devices to the cripple may be roughly divided into three classes:

First.—In inventing or adapting detached devices that will make it possible for cripples to do various kinds of work, such as various devices furnished by the makers of standard typewriters, that enabled a one-eyed, legless, one-armed and one-fingered typist to write many more short letters in a given time than can the unmaimed champion typist of the world.

Second.—In providing artificial limbs to replace those missing. Particular attention is called to the possibilities of inventing countless designs of articulated limbs controlled by systematized use of the trunk muscles controlling the joints of the limbs by means of wires and springs for replacing other muscles and tendons.

Third.—In inventing or adapting devices that may be attached to the cripple himself, not to replace missing limbs, but in effect to supply new ones, i. e., additional limbs that will enable him to use existing equipment and thus accomplish work.

Some Methods of Fuel Conservation

The bureau of mines, department of the interior, recently asked the advice of a number of prominent fuel engineers throughout the country as to the best way to conserve in the use of coal during the period of the war. Martin A. Rooney, stoker expert, Detroit, has the following to say:

"In every trainload of coal laboriously hauled from the mines to our coal bins, one carload out of every five is going nowhere and worse. In a train of 40 cars the last eight are dead load that might better have been left in the bowels of the earth.

"Every fifth shovelful of coal that the average fireman throws into his furnace serves no more useful purpose than to decorate the atmosphere with a long, black stream of precious soot. These are not meaningless statistics nor a "goblin" story, but cold facts on a warm subject. At best, one-fifth of all our coal is wasted.

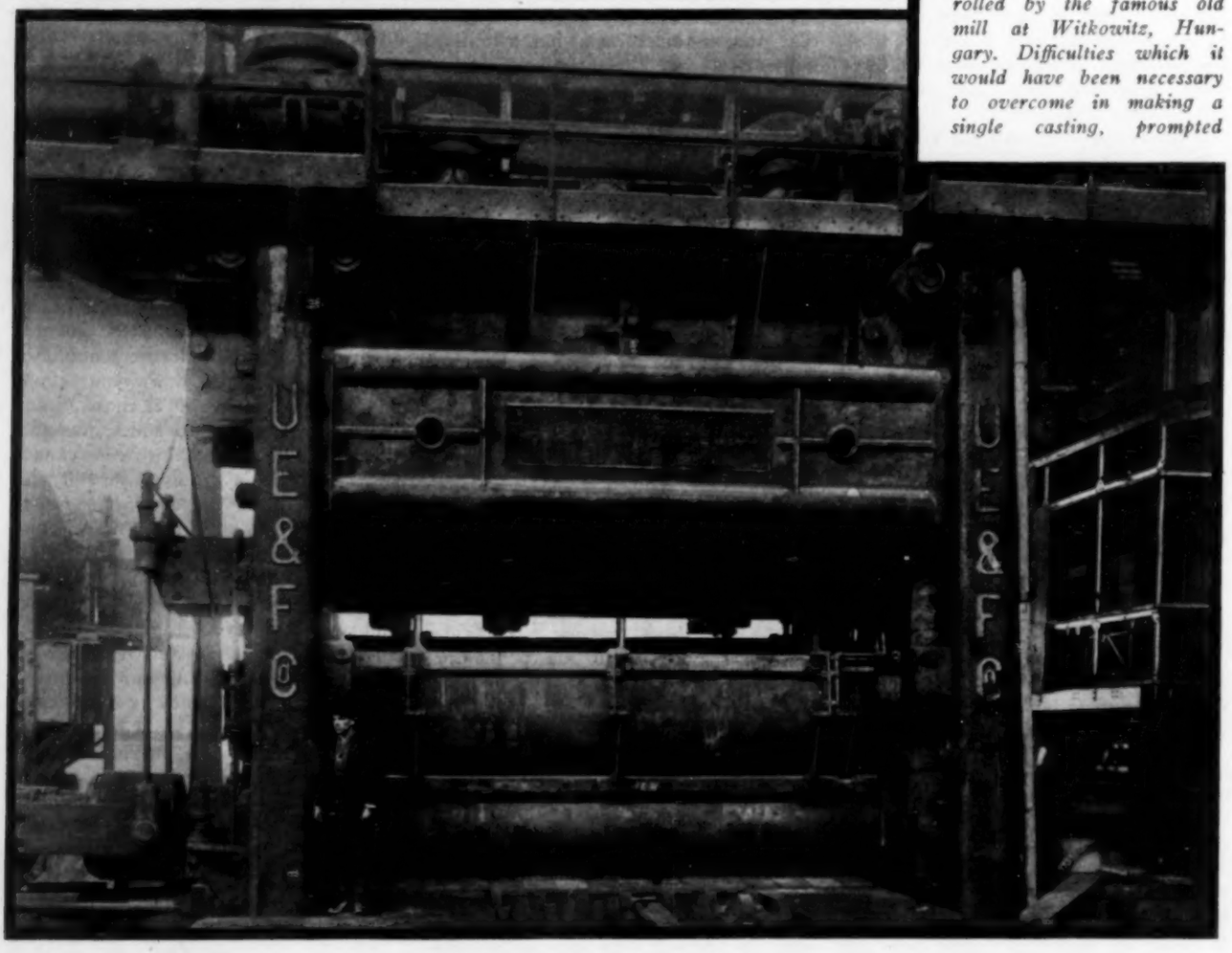
"And it is shamelessly and needlessly wasted. Instruments and machinery for getting out all of the heat there is in it, are not nearly so complicated nor expensive as the cash register which you use to keep tab on your cash receipts or the truck which you operate to clip a few cents off your delivery costs. Carbon dioxide, temperature and draft are easier subjects to comprehend than bank discount or freight rates.

"The moral is, get busy and learn what they are and how to use them. The time is coming when the government is going to limit the amount of coal that is dumped down your chute, and in the name of fairness, when we must deny fuel to some manufacturer, let it be to him who cannot show that he is going to use it efficiently. In the name of fairness to the miner who digs it, in fairness to the heavily burdened railroad which transports it, in fairness to a number of our people whose very existence and whose future happiness depends absolutely on the use we make of this most precious of our resources, let us make efficiency the criterion to judge by when we come to determine which shall survive.

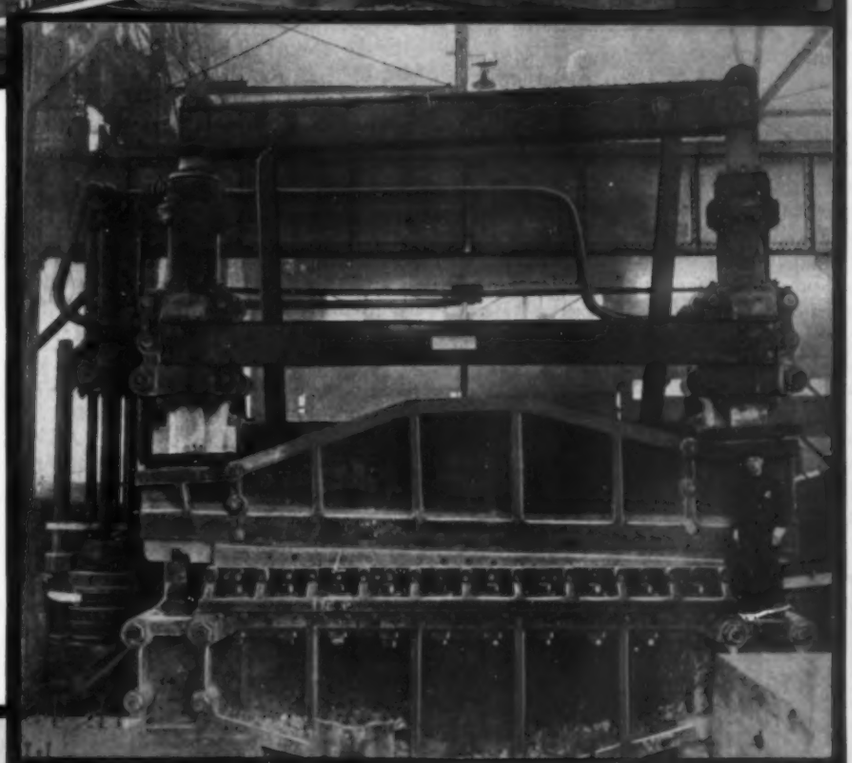
"Let us send in to our furnaces and boiler rooms men who can show our engineers and firemen how to burn their fuel with the least waste, as we have sent them among our fields and orchards to show the farmer how to increase the productivity of his soil."

WORLD'S LARGEST PLATE MILL

COMPLETE, except for a few minor details, the huge new 204-inch plate mill of the Lukens Steel Co., Coatesville, Pa., will soon be regularly turning out a tremendous tonnage for American shipyards and other important war industries. The new mill, which is the largest in the world and the only four-high plate mill in existence, will roll plates 192 inches in width. These will exceed in width by 26 inches the plates rolled by the famous old mill at Witkowitz, Hungary. Difficulties which it would have been necessary to overcome in making a single casting, prompted



PITS TONNAGE AGAINST U-BOATS



the United Engineering & Foundry Co., builder of the mill, to cast the housing in four parts. Power will be supplied by a twin, reversing, condensing engine, built by the Mesta Machine Co. The cylinder dimensions of the power unit are 46 and 70 inches bore by 60 inches stroke. Reproduced above is a view showing the two-to-one pinion housing, friction devices, spindles and method of supporting them. At the right is illustrated the hydraulically operated shear, which is capable of readily cutting mild cold steel, 2 inches thick. This shear was built by R. D. Wood & Co. The steel supporting roll, shown below, is 50 inches in diameter and weighs 65 tons; the working rolls, which are cast iron and 34 inches in diameter, weigh 30 tons.

Flywheel Design for Rolling Mills

The Intermittent Character of the Rolling Mill Load Requires the Equalizing Effect of a Flywheel—Limiting Speed, Location, Load and Control Factors Govern Design

BY G. E. STOLTZ

THE general question of flywheel capacity to be installed on a rolling mill should receive almost as much attention as the application of motors. On electrically driven mills especially it is easy to analyze the requirements of the mills and definitely determine the relation between the motor and flywheel capacity.

The intermittent character of the rolling mill load generally makes it necessary to include flywheel capacity to equalize the power requirements and avoid heavy momentary overloads on the driving unit, as well as on the generating station. In some cases the magnitude of the peak loads is not so great, but it has been found that a small amount of flywheel capacity protects the electrical equipment from shocks obtained on the mill. Where there is a demand for a flywheel to equalize sustained peaks, the use of the proper flywheel effect permits the installation of driving and generating equipment designed to carry a load of practically a constant character. Better over-all economy is obtained although the friction loss of the flywheel is added.

Any mass in motion possesses energy and is capable of doing work by reason of being in motion. According to the elemental theory of kinetic energy this capacity for work is one-half the mass of the moving body times the velocity squared.

When considering the power required to roll steel, the length of pass is usually measured in seconds, and the size of the driving equipment is rated in horsepower. By a simple substitution in the formula for kinetic energy we obtain:

$$\text{Horsepower seconds} = \frac{W v^2}{64.4} \times \frac{1}{550} = \frac{W v^2}{35{,}400}$$

Since energy varies as the square of velocity, it is important to use as great a velocity as is practicable.

The total flywheel effect of a body rotating about an axis is equal to the sum of the products obtained by multiplying every elementary mass by the square of its velocity. The equivalent of this is found by using the total weight and the peripheral velocity at the radius of gyration. The radius of gyration of a plate wheel is 0.707 of the outside radius. This value for a spoke wheel depends upon the displacement of its metal, but for practical purposes, it is satisfactory to use 0.8 of the outside radius for wheels of usual design. In these calculations the weight of the shaft is not included.

Fig. 2 is a curve showing the relation between speed of a wheel and kinetic energy measured in horsepower seconds. It may be noted how rapidly the stored energy increases in the wheel at the higher speeds. The diameter of this particular wheel is 12 feet, its peripheral velocity being 19,400 feet or 3.7 miles per minute. In this particular case the equipment was designed to operate on a basis of 20 per cent drop. The energy which is therefore available for flywheel effect is the difference between that stored at 100 per cent and 80 per cent speed of 62,500-horsepower seconds which is 36 per cent of the total energy in the wheel at 100 per cent speed.

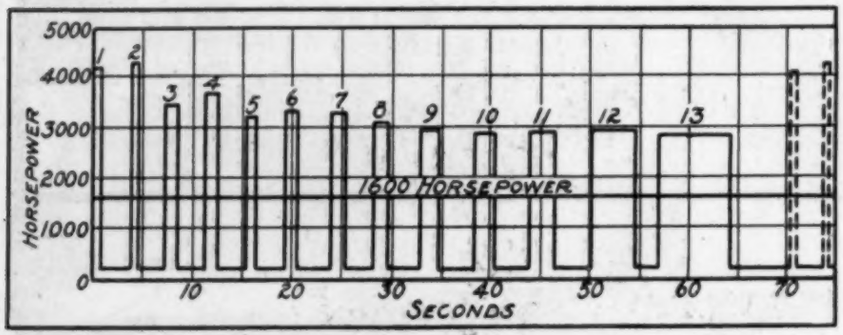


FIG. 1—MILL LOAD ON A SMALL BLOOMING MILL—PEAKS ABOVE 1600 HORSEPOWER TAKEN BY THE FLYWHEEL

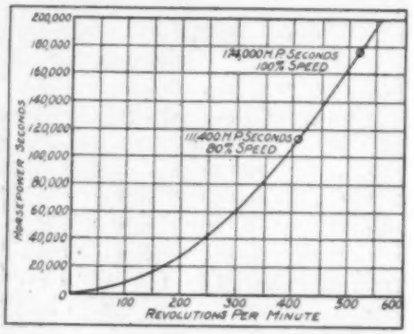


FIG. 2—ENERGY CURVE OF FLYWHEEL SET

Plate wheels are usually limited to a peripheral speed of 25,000 feet per minute, in order to keep the centrifugal stress within 16,000 pounds per square inch. Due to the presence of blow-holes and shrinkage strains it is impossible to calculate the actual stresses in the cast wheels, so that the values of 12,000 feet per minute for solid cast steel and 6000 feet per minute for cast iron wheels, have been arrived at arbitrarily as safe speeds. There are a number of cast steel wheels operating as high as 17,000 feet per minute, but they are of special design and more expensive, due to the rigid specifications they are required to meet.

Location of Flywheel

It is logical that the flywheel should be placed as near the load as possible to avoid transmitting the peaks through apparatus which might otherwise carry only the average load. However, on some applications, such as sheet mills, this is not feasible as the mill speed is too slow. If it were desired to properly equalize the load on an 8-stand mill with a flywheel operating on the mill shaft at 30 revolutions per minute, a wheel of 350 tons weight would be required. This, of course, is not practical, and while on engine-driven mills a com-

From a paper read before the Association of Iron and Steel Electrical Engineers at a meeting in Pittsburgh on Dec. 15. The author is associated with the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

paratively large engine may be used with a moderate sized wheel, still the engine does not fully compensate for lack of flywheel capacity, with a result that the speed drops considerably when peak loads are obtained. With electric drive, the motor is usually operating at about 240 revolutions per minute, and a herringbone gear unit is provided to obtain the proper mill speed. The flywheel capacity is usually obtained by placing a wheel at each end of the pinion shaft. By doing this, the total weight of the wheels would be 30 tons to provide the same flywheel effect as would be obtained if a 350-ton wheel were placed on the mill shaft. This, of course, has the disadvantage of transmitting all the peaks through the gears, but is the practical solution for this type of drive. Where sheet-mill engines have been replaced by motors with adequate flywheel effect, the monthly output may be increased approximately 10 per cent. This is due to the elimination of periods when the mill is slowed down sufficiently to interfere with its operation.

Selecting the Flywheel

The selection of the proper flywheel for a mill drive can often be calculated to a fairly close degree if the operating conditions are properly represented. These conditions can be obtained by comparing the mill in question with a number of similar mills on which an analysis has been made of power requirements. However, on some mills it is practically impossible to make any calculations, in which case it is necessary to depend entirely on tests made on a number of mills of the same type. Unless these tests are used as a guide, it is easy to assume conditions which will not be obtained in actual practice. For instance, tests were made on a motor driving eight sheet mills. Graphic charts were obtained, the total length of each test being 30 minutes. Although a large number of these charts were obtained over a long period of time, it was surprising to find that not more than four stands out of eight had metal in the rolls at the same time. On one chart the following results were obtained:

Time no metal was in rolls....	26.6	per cent
Time metal was in one stand..	39.1	per cent
Time metal was in two stands.	26.3	per cent
Time metal was in three stands	7.36	per cent
Time metal was in four stands	0.64	per cent

Without making much investigation, it might be thought that it would be necessary to provide flywheel effect to take a peak obtained from metal in five or six stands at one time, when in fact only three stands need be considered. On applications of this kind, it is necessary to test similar mills having a different amount of flywheel effect in order to determine which ones have the proper amount. No method of estimating would be of any practical value.

Plotting the Mill Load

Fig. 1 is an estimated mill load on a 3-high 28-inch blooming mill operating at 70 revolutions per minute. The average load is found to be 1284 horsepower. This includes the friction load of the mill and is the value on which the rating of the motor should be based. In preparing a curve like this, no difficulty will be met in determining the length of the passes, as the size and speed of the mill are known.

Observations were made to determine the interval between passes, and it was found that under the most favorable conditions, they averaged from three seconds to 3.8 seconds. Occasionally delays were obtained which increased the intervals even to 10 or 15 seconds, but these were unusual. There will be delays which lengthen the cycle to 80 seconds or more, but it is not safe to estimate on an average cycle of 80 seconds, as this extra time may be introduced after any one or more passes. We might take one of the shortest cycles observed in which let us assume a slight delay occurred during the latter part of the cycle. If, while rolling another ingot, this delay came earlier, the flywheel might not be adequate during the last passes. However, it is a simple matter to assume the minimum interval throughout and let this ideal cycle represent 25 per cent overload on the equipment. Some portion of this cycle will prevail when rolling almost every ingot, but in no case would the equipment be subject to a continuous overload. If it is desired to increase the size of the equipment over the calculated values to take care of unforeseen conditions, this can be done after the correct relation between the motor and flywheel is determined. The everything above 1600 horsepower

Flywheel Energy Expressed in Horsepower Seconds

Pass	Flywheel load during pass	Accumulated flywheel debt at end of pass	Restored during interval	Flywheel debit at end of interval
1	1670	2370	2370	....
2	2050	2050	2050	....
3	1620	1620	1620	....
4	1940	1940	1940	....
5	1800	1800	1800	....
6	2180	2180	2180	....
7	2450	2450	2450	....
8	2520	2520	2520	....
9	2870	2870	2870	....
10	3110	3110	3110	....
11	4570	4570	4200	370
12	5780	6150	4200	1950
13	7150	9100	8400	700

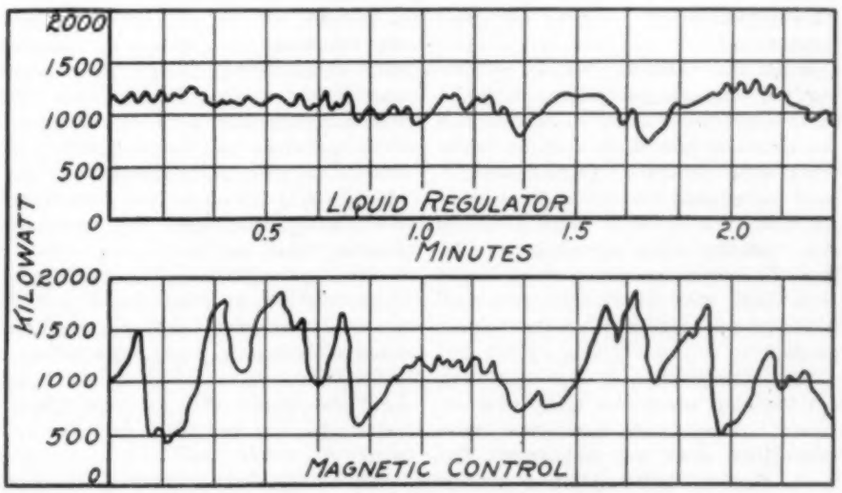


FIG. 3—GRAPHIC WATTMETER CURVES ON A SHEET MILL, COMPARING LIQUID REGULATOR AND MAGNETIC CONTROL ON THE SAME MILL—MOTOR SECONDARY WAS SWITCHED FROM ONE CONTROL TO THE OTHER TO OBTAIN TEST

on both the motor and the flywheel.

The curve in Fig. 1 is plotted using intervals of three seconds between passes and six seconds between ingots. Since this cycle is to impose a load of 125 per cent on the motor, everything above 1600 horsepower should be absorbed by the flywheel during the passes, and during the interval the difference between 1600 horsepower and 200 horsepower friction load, would be restored to the flywheel.

The values given in the second column of the accompanying table representing the flywheel load during the pass, are taken from the load curve. As the flywheel is of sufficient capacity to return 4200 horsepower-seconds during the intervals, it will be observed that the motor is capable of bringing the flywheel back to normal speed, after each pass, until the eleventh pass is reached. At the end of this interval, there is a flywheel debt of 370 horsepower-seconds. Therefore, in starting calculations to determine the size of flywheel, we should start with the eleventh pass and continue the cycle through the thirteenth back to the first and on down to the tenth. During the interval after the first pass, the flywheel debt is wiped out and the wheel again attains normal speed. This continues until the eleventh pass is reached, at which time it again comes to the heaviest part of its cycle.

Application of Data

In the third column it will be noted that the maximum energy which the flywheel must deliver is 9100 horsepower seconds, which is obtained by adding the energy required during the thirteenth pass of 7150 horsepower seconds, to that which has accumulated previous to this pass, which is 1950 horsepower seconds.

The maximum per cent speed drop permitted is 20 per cent at 25 per cent overload. Under ordinary conditions, 15 per cent will not be exceeded. In dropping down to 80 per cent speed, the flywheel has given up 36 per cent of its total energy, which, in this case, is 9100 horsepower seconds, found from our calculations. Therefore, the wheel at its normal speed would have a total of 25,300 horsepower seconds.

As the speed of this mill is 70 revolutions per minute, a split cast-iron wheel can be used having a diameter of 26 feet, which gives a peripheral velocity of 5700 feet per minute. As the radius of gyration of this type of wheel is 0.8 of the outside radius, the velocity at this point is 4560 feet per minute, or 76 feet per second. This latter value is the one which we are to use in the formula.

As we are now interested in obtaining the weight of a wheel which is to have a given amount of energy, this formula should read as follows:

$$\text{Horsepower seconds} = \frac{W v^2}{35{,}400}$$

$$W = \frac{\text{Horsepower seconds} \times 35{,}400}{v^2}$$

$$= \frac{25300 \times 35{,}400}{76^2}$$

$$= 155{,}000 \text{ pounds}$$

The Choice of Control

It is important to take into consideration the type of control used, as some utilize the flywheel effect to a better advantage than others. On the sheet mill referred to previously, Fig. 3 shows the kilowatt input with notching in relays which regulates the amount of grid resistance of the secondary circuit of the motor, while the other curve is taken with the liquid slip regulator in the secondary circuit. The flywheel effect is the same but the regulator does not come into action until the motor is fully loaded. With grid resistance in the secondary of the motor, the flywheel and motor slow down in direct proportion to the load, and when full load on the motor is obtained, the flywheel may be operating at 15 per cent slip and any further peak load cannot be absorbed by the flywheel to the same extent as if it were at its full speed, as is borne out by the two curves. It will be noticed that the average load in each case is 1100 kilowatts.

Quite often motors are applied to tandem or cross-country mills on which the majority of passes are rather long and it would not be natural to expect that a flywheel would be required. The mill, however, may be so arranged that there is an overlapping of several passes which will impose short high peaks upon the motor.

German Made Tubes N. G.

Tests by Prominent Metallurgist Shows Inferiority of Teuton Product—High in Phosphorus and Brittle

VICTORY of American ingenuity over German vandalism in repairing interned German liners was not without honor even for pig iron producers and tube makers. While engineers were engaged in the task of welding the broken cylinders and repairing other parts, the tubes in the boilers of the PRESIDENT GRANT, now the U. S. S. PRESIDENT GRANT, disclosed that all things made in Germany are not superior to competing American goods. This is particularly true of the tubes themselves.

When the PRESIDENT GRANT was being put through preliminary tests before being turned over for war servcie, the discovery was made that her boiler tubes were defective. Orders were issued immediately for the replacement of the tubes and of those taken from the ship, samples were submitted to William Campbell, consulting metallurgist, New York navy yard. His researches disclosed the inferiority of the German product.

Prof. Campbell made the tests without knowing where the tubes were obtained. Along with them other tubes taken from stock were submitted. Two were charcoal iron and two puddled iron. Standard tests were applied, photographs were made and the metallographic report submitted to the navy department where it is now in the official files. Of the one German and four American samples tested, the German one was found to be poorer than the poorest of the four American samples, one which had been rejected by the navy.

"The charcoal tubes were free from mottling but the puddled tubes showed it," Professor Campbell said in his report. "This is what we should expect if we assume that the mottling is due to segregation of phosphorus. None of these tubes showed the abnormally coarse grains met with in the tubes of the U. S. S. PRESIDENT GRANT."

Analyses of the five tubes disclosed the following: In one of the puddled iron samples the phosphorus content was shown to be 0.163 per cent, the silicon content 0.24 per cent, manganese 0.016 per cent and sulphur 0.017 per cent. Another test showed: Phosphorus, 0.111 per cent; silicon, 0.24 per cent; manganese, 0.023 per cent, and sulphur, 0.018 per cent.

The American charcoal-iron tubes disclosed the following: In the first, 0.033 per cent phosphorus; 0.09 per cent silicon; no manganese; and 0.016 per cent sulphur, and in the second, 0.052 per cent phosphorus, 0.02 per cent silicon; no manganese, and 0.017 per cent sulphur.

All of these tubes showed less mottling than the German-made tubes in the PRESIDENT GRANT. In these the phosphorus content was 0.263 per cent, the silicon 0.25 and the manganese 0.02 per cent. The sulphur was about the same as in the American tubes, 0.018 per cent.

Analysis of Electric Steel Making

A Brief Review of the Development of Melting Processes Over the Last 40 Years—General Results of Experiments on Physical and Chemical Properties

BY JOHN A. MATHEWS

FORTY years ago Sir William Siemens constructed and patented an electric arc furnace for melting steel. Although he gave no evidence of a belief in the ultimate commercial success of his laboratory experiment, he formulated a conclusion respecting the superiority of electric furnaces to other types of furnaces, stating that the function of electric melting is to "effect such reactions and decompositions as require for their accomplishment an intense degree of heat, coupled with freedom from such disturbing influences as are inseparable from a furnace worked by the combustion of carbonaceous materials".

Early Development

Early experimenters favored the duplex process and looked with disfavor on the production of electric steel by a combination of the melting and refining processes in one operation. They compared the large amount of slag oxides and general lack of homogeneity of the pure materials used in crucible melting with the product, and concluded that the more uniform liquid product of the open-hearth furnace, made from the same pig iron, formed a more desirable base material for the electric furnace. This, coupled with the reducing and deoxidizing properties of the electric process and its ability to remove sulphur to a great degree, made an ideal combination. This view was accepted about 10 years or more ago by Dr. Heroult and other metallurgists. The earliest installations of electric furnaces included an open-hearth furnace for preliminary melting and refining; the liquid being transferred to the electric furnace for deoxidation, desulphurizing and for making additions or adjustments to bring about the desired analysis. Installations of this kind were made in the United States at the plant of the Halcomb Steel Co., Syracuse, N. Y., which now is in its twelfth year of operation. Other plants soon appeared, both here and abroad, nearly all using the duplex process. In addition to the belief in the metallurgical soundness of the process, there was the further belief that electricity could not be successfully and commercially used to do the first melting. This was true at the time, but now the lower cost of wholesale power and increased electrical efficiency make cold melting feasible in many localities.

Paul Girod, a successful French manufacturer of steel and ferro-alloys, and the inventor of the electric furnace bearing his name, challenged the electric refining ideas then current at a meeting of the society held in May, 1909, stating that one cannot make steel of crucible quality in the electric furnace when a molten charge of open-hearth or bessemer metal is used as a base. Mr. Girod's argument was based on his contentions that at the high temperature of melting, the respective solubilities of open-hearth and bessemer steels for metallic oxides, oxides of carbon, hydrogen and nitrogen were greatly increased; in fact, to such a degree that it was afterward impossible to free the steel wholly from them in the electric furnace, unless the charges were allowed to cool off and were later remelted. Many manufacturers, however, have since experienced little difficulty in this respect and maintain that if large furnaces of greater than 10-ton capacity are to be a success, molten charges must be used, as electric furnaces have not altogether proved themselves to be satisfactory as cold melters. The choice of processes seems to be an economic rather than a metallurgical consideration, and local conditions for each installation must govern the choice, while the final success by either process is a matter of individual skill of operation. Replacement of the crucible furnace, or crucible steel, has not been effected by the electric furnace; its field has been the production of a high grade steel for special purposes. In this capacity, the advent of the electric furnace was timely, in that it met the demands for this class of material—a demand which arose simultaneously with the birth of the automobile, airplane and, more lately, the munitions industry.

Practical results which follow from the conditions obtainable in the electric furnace are due mainly to the fact that "fusion is effected in a perfectly neutral atmosphere", as Siemens concluded in summing up the advantages of his laboratory furnace. With proper handling, the electric furnace has demonstrated its ability to produce a superior product, adequate for the most severe requirements. Exhaustive experiments that demonstrated that:

Claims for Electric Steel

First.—The chemical composition of conconsecutive heats, most notable when handling easily oxidizable metals like vanadium, chromium, silicon and manganese, can be held more closely to a standard than with any other process.

Second.—To insure a given final minimum, less of these metals need be added, hence there will be less of the oxides of these metals produced in the steel and less to be removed.

Third.—Successful heat treating is improved according as composition can be controlled.

Fourth.—Electric steel usually is chemically purer than any other steel. Irrespective of whether or not uniformly distributed sulphur is as harmful as is generally believed, it is obvious that the segregation of elements is impossible if they are absent. It also follows that if the segregation of sulphur and phosphorus are not to be feared, the percentage of cropping may be reduced and the yield of sound metal increased.

Fifth.—Low sulphur in electric steel usually indicates a prior reducing condition favorable to complete deoxidation, sound ingots, freedom from blowholes and resulting seams. Quiet metal has less tendency to segregate in the mold, in respect to either metallic or non-metallic elements, and produces steel free from laminations.

Sixth.—Alloy additions may be made in the furnace itself rather than in the ladle, which increases the probability of thorough assimilation, diffusion and homogeneity.

Seventh.—Results indicate that electric steel is less easily injured by overheating than other steels. It has a wider heat range and will withstand variations in forging and heat treating without injury.

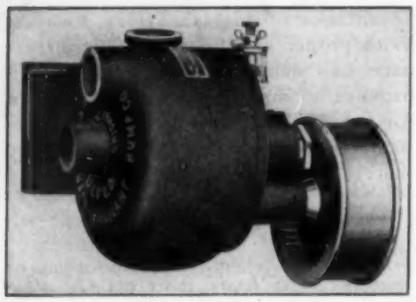
Eighth.—Electric steels are usually freer from slag and nonmetallic inclusions than bessemer and open-hearth steels.

Ninth.—The foregoing characteristics tend toward the production of a steel of better quality. The electric furnace possesses an economic value in its adaptability to the recovery of scrap values, and has decided advantage over the open-hearth furnace in that some alloy scraps do not make desirable additions to open-hearth furnaces, or if such additions are made, usually result in a great deal of the scrap metal being lost in the slag. With the widespread and increasing use of alloy steels it is highly desirable that alloying elements be not lost when contained in the scrap.

From a paper presented at the Detroit meeting of the American Electrochemical society, May 2-5, 1917. The author, John A. Mathews, is president of the Halcomb Steel Co., Syracuse, N. Y.

Manufactures Lubricant and Grinder Pumps

The Fulflo Pump Co., Cincinnati, which a short time ago marketed its new grinder and lubricant pumps, announces that these pumps have been adopted as standard equipment by a number of machine tool builders. One

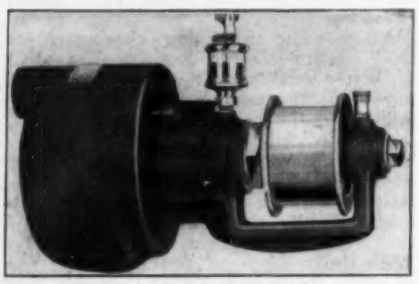


ROTARY LUBRICANT PUMP

of the salient features of the lubricant pump lies in its ability to retain the fluid necessary for priming. Both intake and discharge openings are at the top of the pump and it is impossible for the lubricant to siphon out since a lowering of it will uncover one of these openings, admit air to the body of the pump and break the syphoning action. No strainer is supplied as there are no passages smaller than ¾-inch in diameter. The pump's capacity depends on the speed at which it is operated. Speeds varying from 1200 to 1800 revolutions per minute produce a flow of five to 20 gallons per minute. If heavy oils are used, the flow is approximately two-thirds as great. The pump casing is cast iron, the shaft is cold rolled steel hardened and ground and the bearings are S. A. E. specification bronze.

New Box Tool

A steel tangent-cut box-tool of improved design is being sold by the Biggs-Watterson Co., Cleveland. In this tool strength and rigidity are aimed at by mounting and supporting the cutting members on a one-piece steel body. The tool was designed with the object of eliminating the use of hollow mills. Roller back rests as well as second cutter attachment are supplied as regular equipment. When it is desired to take heavy cuts, all movable parts may be locked to the steel body. The tool bar may be reversed so as to permit the cutter to lead or follow the rollers, and it is said the bits may be removed, ground and replaced without changing the adjustment. The straight line travel of both tool and roll-carrying slides, the maker contends, give support to the work at proper angles and furnish natural clearance to the cutter for all diameters. Three models of the tool are being marketed. Cutting ranges vary from 1/16 to ⅞ inch; turning lengths, from 1 to 2½ inches; shank diameters, from ⅝ to 1 inch; length of shanks, from 1⅛ to 2 inches; and holes through shanks, from ¼ to ½ inch.



CENTRIFUGAL GRINDER PUMP

Guns for Riveting and Slag-Cutting Purposes

Impact delivered through the work of compressed air is the agency employed in operating the rivet-cutting gun manufactured by the Rivet Cutting Gun Co., Cincinnati. The apparatus consists of a cylindrical gun about 4 feet in length, to one end of which is attached an air line leading to a compression source. The air is controlled at the point of admission to the gun, and a cross handle for directing and placing the gun is attached at this point. At the opposite end of the gun is a tool retainer which will hold a rivet-cutting tool, a punch, or a hammer attachment.

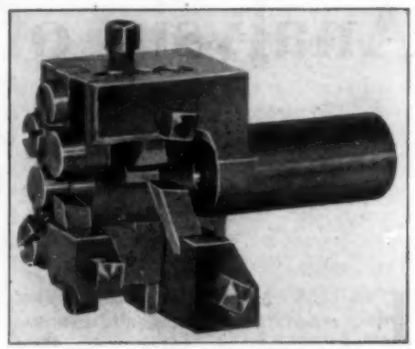
The gun is employed for cutting rivets and driving them out without the application of heat. With this tool it is said that no drilling is necessary and the gun does the work of both a sledge and a cutting bar.

A special gun has been designed for cutting away slag in open-hearth furnaces. This gun is 3 feet 6 inches in length and weighs 60 pounds.

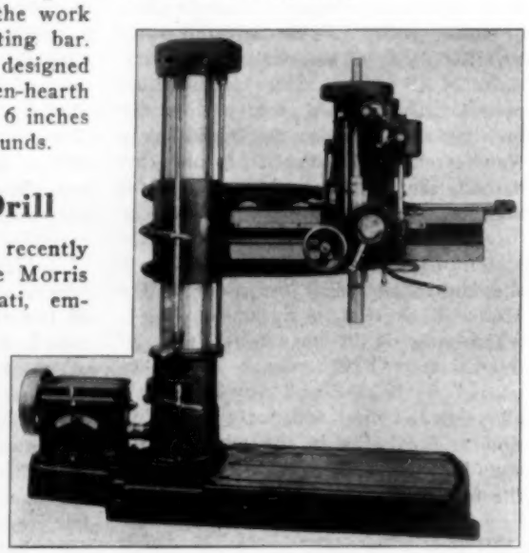
Develops Radial Drill

A new 4-foot radial drill recently placed on the market by the Morris Machine Tool Co., Cincinnati, embodies many practical features. As shown in the accompanying illustration, this tool is of rigid construction throughout. The arm travels up and down the column by power feed and is equipped with stops at the extreme position. The entire weight of the column and arm is carried by a combination annular and thrust bearing. The base is heavy and well-ribbed and is provided with a lubrication channel that drains into a reservoir. All levers are arranged for the convenience of the operator and all gears are enclosed. The head is of heavy construction and is provided with long spindle bearings. It traverses the arm on wide contact surfaces and is actuated by a hand wheel through reduction gears. A tapping attachment is also provided. The spindle is equipped with a ball thrust bearing. All journals are of bronze and are provided with felt wipers. The spindle hole is No. 5 Morse taper.

This machine drills to the center of an 8½-foot circle, while the maximum distance between the spindle and base is 60 inches. The height over-all, with arm and spindle at its highest point, is 10 feet. All gears, with the exception of the semisteel spindle gear are steel. The back gear clutches and clash gears are nickel steel, heat-treated and case-hardened. The machine illustrated is equipped with a speed box drive. This tool is also furnished with cone pulley or direct motor drive.



NEW TANGENT-CUT BOX-TOOL



A NEW RADIAL DRILL

New Light Problems Are Discussed

What the Industrial Commission of Ohio is Doing to Standardize Lighting Methods in Various Industries—A Simple Code Consisting of Four Rules Was Discussed at a Recent Hearing in Cleveland

THE problem of equipping industrial machinery with adequate guards to protect workers against accident has received a great deal of consideration during the last few years. The question of industrial lighting, however, has not been given the attention it deserves. A careful study of the lighting conditions under which workingmen labor in numerous industries discloses the fact that serious injury, total disability and often death frequently occur through incorrect or inadequate lighting. As a matter of fact, 25 per cent of all industrial accidents can be traced to this cause. These factors were mentioned by Victor T. Noonan, safety director of Ohio, in addressing a recent public hearing in Cleveland on a tentative code of industrial lighting, which was prepared by the Industrial Commission of Ohio.

Mr. Noonan also explained that the Industrial Commission does not desire to impose a hardship on employers, but on the other hand the co-operation of manufacturers is encouraged to the end that a just code, which will protect the worker and at the same time not handicap the employer, will be adopted.

Mr. Noonan did not mince words, however, when he stated emphatically that there were employers of labor who in times past had made it a point to block all proposed legislation for the protection of the workingman. "We are here to save lives and limbs," he said.

Prof. F. C. Caldwell of the department of electrical engineering, Ohio State University, is the chairman of the special committee that prepared the code. This code is remarkably free from complications; in fact, it consists of but four rules, as follows:

RULE 1—GENERAL REQUIREMENTS.—Working or traversed spaces in buildings or grounds shall be provided with light during the time in use in accordance with the following rules:

RULE 2—INTENSITY REQUIRED.—There are spaces in industrial properties which need not be lighted. For those which must be lighted the desirable illumination intensity to be provided and the minimum intensity, which shall be maintained, are shown in Table I.

RULE 3—GLARE.—Glare resulting either from natural or artificial light sources shall be avoided.

RULE 4—DISTRIBUTION OF LIGHT ON THE WORK.—Lamps shall be so installed in regard to height, spacing and accessories, as to secure a good distribution of light on the work, avoiding objectionable shadows and objectional contrasts of intensity.

The code also contains an appendix which explains various lighting factors, among them being the following:

FLUX OR QUANTITY OF LIGHT.—Every light source emits a definite quantity of light flux which may be looked upon as a volume of light rays proceeding out from the source on straight lines in all directions. When these fall upon any body, they are either transmitted, reflected, or absorbed.

UNIT OF FLUX—THE LUMEN.—The amount of this flux, other things being equal, is a measure of the value of the source of light. Its unit is the lumen.

CANDLEPOWER.—The unit of light intensity is the candlepower. A lamp is said to give a light intensity of five candlepower in the direction of some given small object when it gives five times as much light to this object as would be given by a candle if it were substituted for the lamp under consideration.

ILLUMINATION.—These two units refer to the light source itself and are independent of its surroundings. When a light source is used for purpose of illumination, the light falling upon a surface to be worked upon, or otherwise observed, becomes the object of interest. This illumination depends not only upon the amount and distribution of the light from the source, but also depends, in a varying degree, upon the reflection from the ceiling, walls and other lighted surfaces.

UNIT OF ILLUMINATION—THE FOOT CANDLE.—This lighting of the surface is called quantitatively illumination and its common unit is the foot candle, which is the illumination on a surface one foot from the light, giving one candlepower in the direction of the surface. The foot candle also corresponds to one lumen per square foot of lighted surface. Minimum and good practice values are given in Table I. In Table II is given a classified list showing the intensity grades recommended for various working places directly connected with the mechanical arts.

Prof. Caldwell read the code, after which a general discussion followed. Taken as a whole, the various manufacturers represented at the Cleveland hearing showed a willingness to cooperate with the industrial commission and many points involving legal technicalities were brought up. Mr. Noonan informed the members of the meeting that they were assembled for the purpose of discussing lighting problems instead of legal points.

Three reels of motion pictures were run which showed how accidents could be caused by improper lighting. Special apparatus was also used to demonstrate the effect of light diffusion, glare and brilliancy.

Table I

Foot Candle Intensities

Grade	Place	Minimum	Good practice
A	Roadways and yard thoroughfares ...	1/20	1/10 to ½
B	Intermediate and auxiliary spaces in interiors.....	¼	½ to 2
C	Rough operations..	1¼	2 to 4
D	Medium operations.	2	3 to 5
E	Fine operations....	3	4 to 8
F	Special operations.	5	7

Table II

Specific Classifications Under Grades A to F

Assembling
C—Rough assembling.
D—Medium assembling.
E—Fine assembling.
F—Extra fine assembling.

Boiler and engine rooms—power houses.
C—Boiler rooms.
C—Coal and ash handling.
D—Engine rooms.
C—Auxiliary equipment.
D—Oil, switch and transformer rooms.
D—Switch boards.
C—Storage battery rooms.

Forge Shops.
C—Rough forging.
D—Fine forging.
D—Drop forging.

Foundries.
C—Rough molding.
D—Fine molding.
D—Core making.
C—Charging floor.
C—Tumbling and cleaning.

Inspecting.
C—Rough inspecting.
D—Medium inspecting.
E—Fine inspecting.
F—Extra fine inspecting.

Machine Shops.
C—Rough bench and machine work.
D—Medium bench and machine work.
E—Fine bench and machine work.
F—Extra fine bench and machine work.
D—Automatic machines (ordinary).
E—Automatic machines (fine).

Plating.
D—Plating.
D—Polishing and burnishing.

Sheet Metal Working.
D—Bench work (ordinary).
E—Bench work (fine).
E—Punch presses, shears, stamps and welders.
E—Spinning.
D—Miscellaneous machines.

Iron and Steel Mills.
D—Automatic machines.
C—Charging floor.
C—Casting floor.
C—Soaking pits and reheating furnaces.
D—Rolling mills.
D—Shears, presses, punches and riveters.
D—Rod mill.
D—Wire drawing (coarse).
E—Wire drawing (fine).
C—Pickling and cleaning.

Note. — Simple and inexpensive foot candle meters are available. By means of these any factory manager can readily inform himself approximately as to the illumination in any part of his factory.

England is Short of Iron

Some Plants Forced to Close—Coal Prices Raised—Government Steel Orders Not So Numerous

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Jan. 10, 1918.

IT still is impossible to report any definite government decision with regard to pig iron prices. Demand is as urgent as ever. In the midlands, at all events, it is quite impossible to meet all requirements. A great deal of iron called for today cannot be supplied. Many of the furnaces are fully booked up, and it is a common experience for large smelters to decline any orders exceeding 25 or 50 tons. The best, however, is being done in the matter of deliveries of small parcels, with a view to the prevention of actual stoppages; but the effort is not always successful, and occasionally one hears of foundries beginning on Tuesday or stopping on Friday, because supplies of pig iron have run out. The position of the small foundry is rather trying, and the decreasing proportion making domestic and similar articles occasionally has to stop for want of iron. However, a great many of the small foundries devote three-fourths of their production to war material, so that, on the whole, they are not being treated badly in the matter of pig iron supplies. In the Cleveland district a very strong tone is reported with good sales.

In the midlands the nonsettlement of the price question causes much dissatisfaction. For several weeks past the question of a subsidy has been hanging fire, but there was a general expectation that the government would grant this. No definite announcement, however, has been made. In the meantime, many makers report themselves in a serious position. Production is costing them in coal and coke alone from 10s ($2.40) to 12s ($2.88) more per ton, while there are other increases.

Mill Situation Upset

If the position of pig iron makers is difficult, it is a bed of roses compared to that of the makers of finished material. They have applied to the government for an advance, various amounts being suggested. It is said they have asked as much as £2 10s ($12) per ton. Undoubtedly, in presenting their claim they have in mind the fact that expenses have increased fully 25s ($6) per ton since the last price was fixed, and they know quite well that the government is entirely indisposed to reopen the price question for a long time to come. They have framed their demand accordingly. They have really met with no success so far and are in a serious dilemma. So far as is known, the workers in pig iron have raised no objection to the subsidy; but the case is very different in the finished iron department, in which wages are governed by the northern and midland wages boards through the machinery of the sliding scale. Employers and workmen alike are very proud of this scale, and, rightly or wrongly, the workmen look upon the subsidy idea as a device to deprive them of further advances. It is said that at a recent meeting of the midland wages board the men declared that the moment a subsidy was introduced they would "down tools". It so happens that, in this attitude, they have a large degree of sympathy from the employers, who will bitterly resent anything that even threatens a rupture of their remarkably cordial relations with their workmen.

Puddled Bar Prices

The position of the maker of finished iron may be judged from the fact that puddled bars easily realize £12 10s ($60) to £12 15s ($60.20), while the price for the finished unmarked bar is £13 15s ($61.20). This leaves £1 ($4.80) to £1 5s ($6) to cover all charges in connection with the finishing rolling.

Merchants have been making further efforts to get American steel, but the only success realized has been in the making of some contracts for wire rods, of which a fair supply has all along been coming from the states. The American makers of rods have shown themselves by no means indisposed to undertake further commitments of this kind; but at present the shipments are being held up for lack of tonnage. When the supply of wire becomes really urgent, it is assumed that the government will make special efforts to provide the requisite ships.

The recent order of the government classing shell discard steel as war material, requiring to be bought or sold strictly under official permit, will probably have a great effect on the Sheffield cutlery trade, where a good deal of this steel has been used for the making of knives. Table cutlery, in fact, for some time has been made almost wholly from this class of material.

There is to be a great increase in the production of alloy steels in Sheffield, makers having been advised by the government that production must be doubled by February, and, if possible, trebled by June next. One effect of the stoppage of work on Russian contracts has been to release a considerable quantity of tools and tool steels, for which very good and satisfactory use can be found.

Lake Men Meet

Vessel Operators Discuss 1918 Movement at Annual Convention

Consideration was given at the annual convention of the Lake Carriers' association at Detroit on Thursday of last week to the problem of handling the 1918 movement of iron ore on the Great Lakes. Harry Coulby, president of the Pittsburgh Steamship Co., and a director of the association, urged that the vesselmen should contract to carry in 1918 a tonnage of bulk freight not greater than the 1917 movement. This action he thought necessary in view of the fact that the 1918 shipments will probably not be much in excess of last year's.

Mr. Coulby, as head of the mobilization committee, which will have general supervision this year over vessel operations on the Great Lakes, stated that a definite program for carrying out this plan of central control would be formulated in March. Some preliminary work has been done but definite action will not be taken until a short time before the season opens when outside conditions, such as available railroad facilities and water levels, will be more clearly defined.

In his annual report, William Livingstone, president of the association, discussed the obstacles which the vesselmen had been forced to overcome last year in satisfying the country's need for iron ore, coal and grain. Despite serious delays from ice conditions and traffic congestion on the land carriers, the total movement of bulk freight closely approximated the record tonnage of 1916.

The officers of the association were re-elected. These officers are William Livingstone, president; J. S. Ashley, vice president; Harvey D. Goulder, general counsel; George P. McKay, treasurer; and George A. Marr, secretary. Members of the executive committee are, William Livingstone, chairman; J. S. Ashley, Harry Coulby, John Mitchell, H. S. Wilkinson, D. Sullivan, G. A. Tomlinson and C. L. Hutchinson.

Ore Production Increases

Production in 1917 Shows Small Gain Over Previous Year—Lake Superior District Supplied 85 Per Cent of Output Last Year

The iron ore mined in the United States in 1917 amounted to about 75,324,000 gross tons, compared with 75,167,672 tons in 1916, an increase of 0.2 per cent. The figures for the two years are so nearly the same, however, that when the final returns are received from all the producers the actual quantity mined in 1917 may prove to have been less than that mined in 1916. The shipments from the mines in 1917 are estimated at 75,649,000 gross tons, valued at $236,178,000, compared with 77,870,553 tons, valued at $181,902,277 in 1916, a decrease in quantity of 2.9 per cent, but an increase in value of 29.8 per cent. The general average value of the ore per ton at the mines for the whole United States was, therefore, $3.12 in 1917, as compared with $2.34 in 1916. The stocks of iron ore at the mines apparently decreased from 10,876,352 gross tons in 1916 to 10,560,000 tons in 1917, or 2.9 per cent.

To obtain these statistics preliminary figures received from producers of nearly 95 per cent of the normal output of iron ore were compiled under the direction of Ernest F. Burchard, of the United States geological survey, and were supplemented by estimates covering the remainder of the output.

About 85 per cent of the ore mined in 1917 came, as usual, from the Lake Superior district, which mined about 63,964,000 gross tons and shipped 64,275,000 tons. These quantities represent a very slight increase and a decrease of 3.2 per cent, respectively, compared with 1916. The shipments of iron ore by water from the Lake Superior district amounted in 1917 to 62,498,901 gross tons, and in 1916 to 64,734,198 gross tons.

The south mined and shipped more than 8,100,000 tons of iron ore, the bulk of which was produced in the Birmingham district, Alabama, but the iron mines of Georgia, Tennessee, North Carolina and Virginia contributed about 1,400,000 tons to the total. The northeastern states—New Jersey, New York and Pennsylvania—increased their production slightly as compared with 1916 and shipped to blast furnaces approximately 2,446,000 tons of ore. This quantity, however, represented a decrease of 4.1 per cent as compared with shipments in 1916. Colorado, New Mexico and Wyoming, the principal iron ore producing states in the west, are estimated to have mined and shipped approximately 666,000 tons of iron ore, compared with 717,660 tons in 1916, a decrease of 7.2 per cent. Other states, such as California, Connecticut, Iowa, Maryland, Massachusetts, Missouri, Nevada, Ohio, Utah and West Virginia, in which there are small iron mining operations, are estimated to have shipped about 144,000 tons of ore, compared with 134,002 tons in 1916, an increase of 7.5 per cent.

The imports of iron ore for the 11 months ending Nov. 30, 1917, according to the bureau of foreign and domestic commerce, department of commerce, amounted to 913,500 gross tons, so that probably the imports for the whole year reached 988,500 tons, compared with 1,325,736 tons in 1916.

The accompanying table shows the iron ore mined and shipped in the United States by the principal producing states. The figures for 1916 are final, but those for 1917 are subject to revision.

Making Gun Bed Plates

The Lake Erie Engineering Co., Buffalo, has been purchased by St. Louis capitalists and will hereafter be known as the O'Neil Iron Works. The foundry, which has been idle for five years, has been placed in operation and at present is molding bed plates for United States coast defense guns. The O'Neil plant also manufactures engines, cane sugar mills and crushers, and general machinery including head punches, hydraulic shell presses, tire forcers, etc. The officers of the O'Neil Iron Works are as follows: J. F. O'Neil, chairman of the board; J. W. O'Neil, president; W. D. O'Neil, vice president; and D. S. Drake, treasurer. These officials recently disposed of their holdings in St. Louis known as the Fulton Iron Co.

More Steel

Promised Government by Canadian Makers—Suggest Tearing Up Tracks

Toronto, Can., Jan. 17.—As a result of conferences held between the war committee of the Canadian government and representatives of the steel manufacturing companies to consider the question of steel shortage, it is announced that the manufacturers have undertaken to increase this year's output of steel 20 per cent over last year, provided the raw materials are available as usual.

The plans of the Canadian government for ship construction, as recently announced by Hon. C. C. Ballantyne, minister of marine, have been somewhat modified as regards the sizes of vessels to be built. The type to be constructed in the yards on the Great Lakes will be of 2800 tons. and the two other classes, which will

Iron Ore Mined and Shipped in the United States in 1916 With Estimates for 1917

District	Ore mined, gross tons: 1916 Actual	Ore mined, gross tons: 1917 Estimate	Ore shipped: 1916, Actual: Quantity, gross tons	Ore shipped: 1916, Actual: Value	Ore shipped: 1917, Estimate: Quantity, gross tons	Ore shipped: 1917, Estimate: Value
Lake Superior:						
Michigan	18,071,016	17,709,000	18,995,797	$49,054,340	17,473,000	$61,505,000
Minnesota	44,585,422	45,053,000	45,869,251	106,628,784	45,624,000	141,450,000
Wisconsin	1,304,518	1,202,000	1,529,459	3,644,542	1,178,000	3,703,000
Total	63,960,956	63,964,000	66,394,507	159,327,666	64,275,000	206,658,000
Southeastern states:						
Alabama	6,747,901	6,707,000	6,801,839	10,843,231	6,733,000	13,279,000
Georgia	256,949	318,000	252,143	413,259	297,000	995,000
North Carolina, Tennessee	520,140	616,000	532,047	986,345	613,000	1,766,000
Virginia	440,492	471,000	486,798	1,000,118	475,000	1,193,000
Total	7,965,482	8,112,000	8,072,827	13,242,953	8,118,000	17,233,000
Northeastern states:						
New Jersey....	493,004	501,000	528,084	1,877,056	489,000	2,295,000
New York.....	1,342,507	1,365,000	1,464,917	5,571,429	1,383,000	7,612,000
Pennsylvania ..	559,431	574,000	558,556	702,633	574,000	1,001,000
Total	2,394,942	2,440,000	2,551,557	8,151,118	2,446,000	10,908,000
Western states: Colorado ..... New Mexico. Wyoming	717,660	666,000	717,660	736,241	666,000	803,000
Other states...	128.632	142,000	134,002	444,299	144,000	576,000
Grand total..	75,167,672	75,324,000	77,870,553	$181,902,277	75,649,000	$236,178,000

be built in plants on the seacoast, will be of 5000 tons, and of from 8200 to 10,000 tons, respectively. The number to be built is as yet undecided. It is understood that an adequate supply of ship plates for the vessels to be built this year can be secured from the United States. Negotiations are in progress with the Dominion Steel Corp., Nova Scotia Steel & Coal Co. and Algoma Steel Co., looking to the establishment of rolling mills in connection with their plants as a permanent source of supply. These companies are inquiring into the economic feasibility of the project, which it is estimated would involve an expenditure of about $3,000,000 in each case. Should it be found impracticable, the government has in view the establishment of its own mills. The question as to the operation of the government ships has not yet been settled. It may either operate them itself or adopt the plan of the British government and hand them over to private shipping companies, paying the latter operation fees, and retaining excess earnings for the public treasury.

The Canadian Bartlett Automobile Co., Ltd., of Toronto, capitalized at $10,000,000 with factory in Stratford, Ont., went into liquidation of the 15th inst., when the court granted a winding up order on the petition of R. C. Bartlett, director. The liabilities are stated at approximately $8500, including $7000 for wages.

The Canadian railway war board has decided to recommend to the government that in order to supply the urgent need for steel rails to keep the leading roads in operation, between 1500 and 2000 miles of rails on lines not so vitally necessary should be taken up and relaid on the main arteries of traffic. At least 20,000 laborers would be required, and as no such supply is available they ask the government to hold up the Chinese laborers who are passing through Canada to Europe and employ them for this purpose. Owing to the general shortage of labor, all sorts of reports and suggestions for the conscription of workers, particularly aliens, are current, but so far no decisive action has been taken. The labor unions, while some of them are disposed to favor the conscription of aliens, are strongly opposed to Chinese labor.

Representatives of the steel companies had a conference at Ottawa with the imperial munitions board Jan. 9, respecting the inspection of munitions. They complain of the number of rejections and object to the method of inspection. The work is done by a company employed by the British government, and the manufacturers claim that unskilled men are employed. The board did not hold out much hope of a change in the system.

The government has decided for the present and until further notice to permit under license the free export of the metals, molybdenum, tungsten and their ores, concentrates, alloys and chemical salts to approved consignees in the United States and France. Since the embargo was placed

Obituaries

EDWARD McKIM HAGAR, president of the American International Steel Corp., subsidiary of the American International

EDWARD McKIM HAGAR

Corp., died suddenly Jan. 18 from pneumonia, at his home, 960 Park avenue, New York City, at the age of 45. Mr. Hagar was prominent in the iron and steel industry having served as president of the Universal Portland Cement Co., a subsidiary of the United States Steel Corp., for 15 years. After graduating from the Massachusetts Institute of Technology in 1893 and from Cornell university in 1894, he organized and conducted the business of Edward M. Hagar & Co., Chicago, manufacturers' representatives in different lines. Upon the formation of the Universal Portland Cement Co., in 1900, he was elected to the presidency, in which connection he served until February, 1915, when he resigned. For a term of two years he was president of the Association of American Portland Cement Manufacturers and he also was organizer of the Cement Production Exhibition Co., which held its first annual industrial exhibition in 1907.

John Wesley Ostrander, founder of the Ostrander-Seymour Co., Chicago, a pioneer in building printing machinery, died recently and was buried Jan. 12.

Frederick M. Bachman, president of the Indianapolis Drop Forge Co., and the V. M. Bachman Lumber Co., Indianapolis, died recently in that city at the age of 68 years.

Nathaniel Hoyt Ingraham, formerly president of the Taber Organ Co., but latterly treasurer of the Worcester Lawn Mower Co., Worcester, Mass., died recently at his home in that city at the age of 76.

Joseph Thonet Sr., inventor of the first lower lever breechloading shotgun, died suddenly, Jan. 6, in Brooklyn, N. Y. He was born in Liege, Belgium, in 1820, and came to this country in 1859.

Rear Admiral John Adams Howell, U. S. N., retired, inventor of gyroscopic steering torpedoes and other naval weapons, died of pneumonia, Jan. 11, at Warrenton, Va. He was born at Bath, N. Y., in 1840 and participated actively in the Civil war.

Colonel Thomas L. Livermore, vice president of the Calumet & Hecla Mining Co. for 21 years, died at his home in Boston, Jan. 10. He was born in Galena, Ill., in 1844. He held official positions in several other large mining corporations.

Carl Anderson, vice president Anderson Engine Co., 4036 North Rockwell street, Chicago, died recently after a lingering illness covering a period of 12 months, age 66. He was also founder and late president of the Carl Anderson Co., Chicago, machinist.

Cornelius W. Walls, Worcester, Mass., identified with the iron industry as an ornamental iron worker, etc., since 1872 in that city, died Jan. 12 from internal injuries received in a coasting accident earlier in the week, aged 71.

Labor War Board Formed

Secretary of Labor Wilson Names Committee of Six to Advise With Him in Handling Employment Questions

SINCE the council of national defense with the approval of the President, recently placed in the hands of Secretary of Labor Wilson, the formulation and execution of a war-labor administration, the latter now has appointed a national war-labor board to be known as the advisory council. This consists of six men and one woman, as follows: John Lind, chairman, former governor of Minnesota, who was President Wilson's envoy and personal representative to Mexico; as representative of the public, Waddill Catchings, president of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.; and chairman of the war committee of the chamber of commerce, and A. A. Landon, general manager American Radiator Co., Buffalo, who is likewise vice chairman of the aircraft board of the council of national defense, as representatives of the employers; while John B. Lennon of Illinois, former treasurer of the American Federation of Labor and a member of the industrial relations commission in 1912 with former Congressman John J. Casey of Pennsylvania will act for the employes. Prof. L. C. Marshall, of the University of Chicago, will serve as an economist, while Agnes Nestor of Chicago, president Chicago Woman's Trade Union League, member of the committee on women's defense work, council of national defense and member of the subcommittee on women in industry, will represent women on this council.

Secretary of Labor Wilson intends later to increase the council by appointing representatives from the war, navy and agriculture departments and the shipping board. Standardization of labor policies; the providing, distributing and maintaining of a stable and adequate supply of workers; labor dilution and training; priority demands; the adjustment of disputes and the safeguarding of employment, living and housing conditions are some of the problems that will be taken up immediately.

Big Decline in Seven-Day Furnace Work Shown

Statistics published recently by the United States department of labor, cover a 2-year period in the iron and steel industry ending May, 1915. The value of this bulletin largely is for comparative purposes, since the data end at the time the general depression in the iron and steel industry began to subside. That depression had not materially affected rates of pay, which had substantially increased in the spring of 1913. However, by affecting the tonnage output and consequently the incentive for rapid work, it did decrease the earnings per hour of tonnage workers. As compared with May, 1913, tonnage workers' full time weekly earnings in blast furnaces, in May, 1915, decreased 4 per cent. In bessemer plants, blooming and sheet mills, bar mills, standard rail mills and open-hearth plants, the per cents of decrease were 10, 5, 4, 3 and 1, respectively. Plate mills showed no change while tin plate mills showed an increase of 3 per cent.

A marked reduction in seven-day work is noted. Whereas 97 per cent of blast furnace workers worked seven days a week in 1907, only 59 per cent worked full time in 1915. The per cents for 1913 and 1910 are 80 and 95, respectively. In 1915 the average rate per hour for laborers was 18.0 cents while the full-time hours per week averaged from 57.5 to 74.3.

English Get Much Less

The high puddling wages now prevailing in this country contrast sharply with those being paid in England. While $14.30 per ton is the rate in the United States until February, the rate in Birmingham, Eng., is but $4.258 per ton. Consul E. Haldeman Dennison reports that a bonus of $0.122 is paid to puddlers only so that while other mill and forge wages remain unaltered, the total rate for puddlers until Feb. 2 will be $4.38 per ton. This announcement was made recently by the Midland iron and steel wages board.

Labor Notes

More than 1,000,000 are being furnished employment by the industrial plants of Ohio, one-third more than a year ago, according to the estimates of the state industrial commission.

Work for approximately 70,000 persons was obtained during 1917 by the State-City Free Labor Exchange, Cleveland, which co-operates with the state clearing house at Columbus.

Eleven states—all of them with the exception of North Dakota in the south—are lacking some sort of workmen's compensation, according to the annual report of the workmen's compensation publicity bureau.

The strike of molders employed by the Androscoggin Foundry Co., Auburn, Me., has been settled. The demand for a minimum wage scale of $4 per day has been granted and the men have returned to work.

Men employed by the Webster Mfg. Co., Tiffin, O., in its gray iron foundry to take the places of union molders discharged because they wouldn't work with non-union men, went out on strike recently. They demanded $7 per day instead of the $6 they were receiving.

Notification that the 10 per cent bonus system will continue in force from Jan. 1 until July 1, 1918, has been given the employes of the Standard Co., the Excelsior Needle Co., and the Progressive Mfg. Co., subsidiaries of the Torrington Co., Torrington, Conn.

Based on a survey made in 15 states for the National League of Women's Service, it is estimated that 1,200,000 women are engaged in war industry in the United States, with approximately 100,000 of that number making munitions. In 1910 but 3500 women were employed in munition factories.

To enforce a demand for higher wages, shorter hours and recognition of the union machinists employed in seven shops at Oshkosh, Wis., have struck. The Oshkosh trades and labor council has adopted a resolution for a general union strike to support the machinists in their demand for an advance from 42½ to 45 cents an hour and advances to 30 and 35 cents for helpers and specialists, respectively.

Three reasons are given by the Massachusetts state board of labor and industries for the increase in awards under the state compensation act from $1,700,000 in the year ending June 30, 1913, to slightly more than $5,000,000 in the year ending June 30, 1917. They are as follows: Faulty methods of reporting in 1913, the abnormal industrial conditions in 1917 and the increase in the maximum award of from 50 to 66-2/3 per cent of the wages.

That thrift stamps will serve the double purpose of rewarding faithful regular service and promote thrift is the hope of the Queen City Machine Tool Co., Cincinnati, O. Each man who works four full weeks straight will receive five 25-cent stamps. If 12 weeks are made without a break, an extra stamp is given and the odd amount is paid to make a $5 war savings certificate. Modifications of this plan are made when less regular time is shown by the time clock.

Non-Essential Plants Win Victory

Fuel Administration's Sweeping Order for Conservation of Coal by General Industry Interpreted as Change of Heart in Policy Toward Non-War Manufacturers —Heavy Loss Arises From Indefiniteness of Order

WASHINGTON, Jan. 21.—The order of Fuel Administrator Garfield for conservation of fuel is virtually a victory of nonessential over essential war industries. For weeks the administration has been considering conservation in certain industries not engaged in essential war production and only one order has been issued although several agreements had been effected by which nearly 15,000,000 tons of coal were to have been saved this year. Now, apparently, this is all off.

Dr. Garfield, in his testimony before the senate committee on manufactures said it is expected the conservation order will save from 35,000,000 to 50,000,000 tons of coal. This is the total amount which had been expected to be saved through curtailing nonessential industries. No reason was given by the administrator as to why he had abandoned the nonessential conservation plan but it has been hinted that the nonessential producers used such pressure as to have the administration include all industry in the general order.

Wants Effect Equalized

The administrator said it was desired that no one industry profit at the expense of the other, whether any particular plant used coal, coke, wood, waterpower, gas or other fuel, either on hand or easily obtained. This, he stated, was to equalize the burden of sacrifice. It was absolutely essential because of congestion at seaboard terminals and on the railroad rights of way. In discussing the enormous economic loss which will be entailed through enforcement of his order, Dr. Garfield said:

"The economic loss of war we agree is untold, it is beyond estimating; but we throw it away, so to speak, in the face of a necessity that compels us to go forward with the chief business in hand. If we are arguing the case on the basis of pure economics, I have not a word to say to justify the act of myself as fuel administrator."

No word has been passed at the administration but it is generally conceded that with this explanation, the "coal budget plan", decided upon only a short time ago, has gone glimmering and that nonessential industries, as they are able to obtain materials, will be permitted to operate freely and unhampered.

A statement of the administrator in his third explanation, said: "To single out industries not engaged to some extent in war manufacture is to select industries which in the aggregate will bring relief only if suspended indefinitely. To require all industries except a comparatively small part to cease for a few days quickly accomplishes the desired result and permanently injures none. This order as it stands put all industry on an equal footing, favoring none and avoiding unfair competition."

Blast Furnaces Exempt

Blast furnaces, by-product and beehive coke plants, iron and nonferrous metal ore mines, coal mines, and other raw material industries, because of the need of those materials and because of the loss involved in shutting down plants where continuous heats are necessary, have been exempt from the general coal conservation order by section I and section III, exception (a), of the order itself.

Section I exempts by-product coke plants supplying gas for household use. As many such plants furnish this gas, they are automatically exempt. If they do not, they may come under section III, exception (a), which exempt "plants which necessarily must be continuously operated seven days each week to avoid serious injury to the plant itself or its contents." This section applies to other general exemptions.

Haphazard Decree Criticized

Severe criticism is being heaped upon the fuel administration for the haphazard manner in which the coal conservation order was issued without first exempting plants which since have been told they may operate after having been forced to shut down. The financial loss because of this contradiction of orders, which apparently could have been avoided by establishment of an exemption list first, undoubtedly has been enormous.

When the summary of the official order was sent out like a bolt from the sky, Wednesday night, it declared no industries, not even those working on government war contracts, would be exempt. This same declaration was officially affirmed in the order itself and was repeated in explanatory statements by Fuel Administrator Garfield. And simultaneous with the release of the official order there came a list of 42 plants, owned by 35 companies, which would be exempt.

This list was the first intimation of exemptions and the flood of protesting telegrams which reached the President, Da Garfield and the heads of various government war purchasing departments had the effect of hundreds of additions being made to those industrial plants previously exempted.

Many steel mills, after shutting down cold, were telegraphed permission to fire up again. No announcement has been made of what mills were included in this new list.

The second list of exemptions, which includes those of the first, follows:

Gas Mask Manufacturers

B. F. Goodrich Co., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Mechanical Rubber Goods Co., Cleveland.
C. Kenyon Co., Brooklyn.
Gas Defense Plant, Long Island, N. Y.
Astoria Light, Heat & Power Co., Astoria, Long Island.
Fulford Manufacturing Co., Providence, R. I.
Nashawanna Mill, New Bedford, Mass.
Wamsutta Mill, New Bedford, Mass.
Sayles Bleacheries, Saylesville, R. I.
Hero Manufacturing Co., Philadelphia.
All plants of the Du Pont Powder Co.

Explosives Manufacturers

Hercules Powder Co., Wilmington, Del.
Aetna Powder Co., New York.
Du Pont Powder Co., Wilmington, Del.

Arms Manufacturers

Savage Arms Co., Utica, N. Y.
Marlin Arms Corp., New Haven, Conn.
Remington U. M. C. Co.
Colt Patent Fire Arms Co., Hartford, Conn.
Marlin Rockwell Corp., New Haven, Conn.
Winchester Repeating Arms Co., Eddystone, Pennsylvania.
U. S. Cartridge Co., Lowell, Mass.
National Brass & Copper Tube Co., Hastings, N. Y.
Peters Cartridge Co., Cincinnati.
Western Cartridge Co., Upper Alton, Ill.
Smith & Wesson, Springfield, Mass.
U. S. Machine Gun Co. (Hopkins & Allen plant, Meriden, Conn.)

Manufacturers of Forgings

Bethlehem Steel Co., South Bethlehem, Pa.
Midvale Steel Co., Nicetown, Pa.
Hydraulic Pressed Steel Co., Cleveland.
American Car & Foundry Co., Detroit.

Makers of Other War Essentials

Allis-Chalmers Mfg. Co., Milwaukee.
Burks Electrical Co., Erie, Pa.
Electric Machinery Co., Minneapolis.
General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago.

Jeffrey Mfg. Co., Columbus, O.
Pittsburgh Transformer Co., Pittsburgh.
Reliance Electric & Engineering Co., Cleveland.
Triumph Electrical Co., Cincinnati.
Westinghouse Electric & Mfg. Co., East Pittsburgh.
Julius King Optical Co., 12 Maiden Lane, New York.
Taylor Instrument Co., Rochester, N. Y.
National Cash Register Co., Dayton, O.
Sperry Gyroscope Co., Manhattan Bridge Plaza, Brooklyn.
American Radio & Research Corp., 21 Park Row, New York.
American Steel & Wire Co., Trenton, N. J.
Bausch & Lomb Optical Co., Rochester, New York.
Hartzell Walnut Propeller Co., Piqua, O.
West Woodworking Co., Chicago.
Flottorp Mfg. Co., 4611 West Twelfth street, Chicago.
John A. Roebling Sons Co., Trenton, N. J.
Western Electric Co., 463 West street, New York.
Weston Electric Instrument Co., Waverly Park, Newark, N. J.
Eastman Kodak Co., Rochester, N. Y.
Splitdorf Electric Co., 98 Warren street, Newark, N. J.
Wyman Gordon Co., Worcester, Mass.
American Propeller Co., Baltimore.
Astoria Veneer Mill & Dock Co., Long Island City, N. Y.
Curtiss Engineering Corp., Garden City, Long Island, N. Y.
L. W. F. Engineering Co., College Point, Long Island, N. Y.
Aeromarine Plane & Motor Co., Keyport, New Jersey.
The Burgess Co., Marblehead, Mass.

Manufacturers of Locomotives

American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Corp., Lima, O.
H. K. Porter Locomotive Co., Pittsburgh.

For the manufacture of products intended for the shipping board the following firms are exempt:
General Electric Co., Erie, Pa.
General Electric Co., Schenectady, N. Y.
General Electric Co., Lynn, Mass.

Builders of Destroyers

Fore River Shipbuilding Corp., Quincy, Mass.
William Cramp & Sons Ship & Engine Building Co., Philadelphia.
New York Shipbuilding Co., Camden, N. J.
Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

For the manufacture of forgings for destroyers:
Camden Forge Co., Camden, N. J.
Allis-Chalmers Co., Milwaukee, Wis.
Erie Forge Co., Erie, Pa.

For the manufacture of boilers for destroyers the following firm is exempt:
Babcock & Wilcox Co., Bayonne, N. J.

For the manufacture of seamless tubes less than 1½ inches in diameter:
National Tube Co., McKeesport, Pa.
Pittsburgh Steel Tube Co., Pittsburgh.
Pittsburgh Steel Products Co., Pittsburgh.
Ohio Seamless Steel Tube Co., Shelby, O.

For the manufacture of condenser tubes ¾ inch in diameter:
American Brass Co., Bridgeport, Conn.
Bridgeport Brass Co., Bridgeport, Conn.

Aircraft Products Makers

A. C. Clark Co., Chicago.
Packard Motor Co., Detroit.
Ford Motor Co., Detroit.
Lincoln Motor Co., Detroit.
Trego Motors Corp., New Haven, Conn.
Nordyke & Marmon Co., Indianapolis.
Union Switch & Signal Co., Swissvale, Pa.
Pittsburgh Model Engine Co., Pittsburgh.
Wright Martin Aircraft Corp., New Brunswick, N. J.
Willys Overland Co., Toledo, O.
Aeronautical Engineering Corp., Long Island City, N. Y.
General Motors Corp., Detroit.
Curtiss Aeroplane & Motors Corp., Buffalo.
Thos. Morse Aircraft Corp., Ithaca, N. Y.
Fisher Body Corp., Detroit.
Dayton Wright Airplane Co., Dayton, O.
Standard Aeroplane Corp., Elizabeth, N. J.
Cutler Desk Co., Buffalo.
Rubay Co., Cleveland.
Engel Aircraft Co., Niles, O.
Lewis Spring & Axle Co., Chelsea, Mich.
W. H. Mullins Co., Salem, O.
National Gauge & Equipment Co., La Crosse, Wis.
U. S. Gauge Co., Sellersville, Pa.

Shipbuilding Companies

Bethlehem Steel Co.
Midvale Steel & Ordnance Co.
Lukens Steel Co., Coatesville, Pa.
Carnegie Steel Co.
Crucible Steel Co., Pittsburgh.
La Belle Iron Works, Steubenville, O.
Otis Steel Co., Cleveland.
Lackawanna Steel Co., Buffalo.
Illinois Steel Co., Chicago.
Jones & Laughlin Steel Co., Pittsburgh.
Donner Steel Co., Buffalo.
Inland Steel Co., Indiana Harbor, Ind.
Central Steel & Iron Co., Harrisburg, Pa.
Republic Iron & Steel Co., Youngstown, O.
Brier Hill Steel Co., Youngstown, O.
McKinney Steel Co., Cleveland.
Forged Steel Wheel Co., Butler, Pa.
Whittaker-Glessner Co., Portsmouth, O.
Youngstown Sheet & Tube Co., Youngstown, O.
Alan Wood Iron & Steel Co., Conshohocken, Pa.

War Board Will Control Shipping Licenses

Washington, Jan. 22.—In order to secure an even closer supervision over foreign commerce than has existed in the past, the war trade board has adopted a set of regulations governing the granting of licenses for necessary fuel and stores for vessels in foreign trade. These regulations become effective on and after Feb. 1.

They are specifically set forth in "General Rules No. 1". To secure a license it will be necessary for the owner of a vessel under the flag of a neutral country to sign an agreement binding himself to comply with the rules. The foreign owner of vessels under the flag of a neutral country must vest someone in the United States with the proper authority to enter into an agreement with the war trade board.

Voyages and charters for all neutral vessels and all American vessels not requisitioned by the United States shipping board, however, should still be approved by the chartering committee at New York. The war trade board will receive from the chartering committee notice of its decisions.

It will be impossible for any vessel to clear port without securing a license. In order to prevent a heavier loss of tonnage, the rules likewise provide that no application shall be granted for a sailing vessel wishing to enter the war zone. The applicant for a license must also sign an agreement that the vessel will return to the United States for discharge of the entire return cargo.

The war trade board at the present time is distributing the printed regulations which include forms of agreements, affidavits, applications and licenses.

Scrap Exports Barred

Washington, Jan. 15.—The war trade board has issued a warning to exporters that the classification of second-hand rails, car wheels, etc., or any articles of iron and steel, as such when it is the intention to use them as scrap at their destination, constitutes a violation of the trading-with-the-enemy act and subjects the shipper to penalties provided in the law. Such classification is false declaration. At the board's headquarters it was not stated whether any violations had occurred, but it was said the situation calls for warning. Scrap is under general embargo, but second-hand rails, car wheels, etc., except when consigned to any of the European neutrals, take license under their own identity and, if intended ultimately for scrap, would lead to violation of the law.

Exhibit Trade Papers

Over 1000 trade journals, house organs and advertising sheets form one of the most interesting features of a technical exhibit being conducted at the Newark library and museum, Newark, N. J. In addition to the trade journals, the exhibit, which will continue till Feb. 12, shows the developments of a number of local industries and presents much information on technical subjects in general.

Stops Gun Making

The S. R. Avis & Sons Co., West Haven, Conn., maker of gun barrels and operating under a contract with the New England Westinghouse Co., has closed its plant and laid off 500 hands as a result of the cancellation of the Russian gun contract. The company had completed 350,000 of an order received in October for 400,000 barrels, and had been in operation about two years. Its output was 2500 barrels a day.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

ANDREW GRAY YOUNG, traffic manager of the American Sheet & Tin Plate Co., who has been appointed chairman of the subcommittee on traffic by the general committee on steel and steel products of the American Iron and Steel institute, with headquarters at 71 Broadway, New York, was born at Peoria, Ill., in 1861. After graduating from high school in 1879, he entered the railroad serve as clerk for the Toledo, Peoria & Western railroad. His advancement was rapid, and after serving in traffic departments of several roads, he was appointed assistant freight manager of the Fort Wayne, Cincinnati & Louisville and Lake Erie & Western railroads. He was affiliated with those roads until 1899 when he resigned to accept the position of traffic manager of the American Tin Plate Co., which is now the American Sheet & Tin Plate Co., where he has remained until the present time. The eleven other members of the subcommittee on traffic conditions include nine traffic managers of various steel companies as follows: S. P. Bentley, Illinois Steel Co., Chicago; J. M. Gross, Bethlehem Steel Co., Bethlehem, Pa.; H. R. Moore, Republic Iron & Steel Co., Youngstown, O.; L. C. Bihler, Carnegie Steel Co., Pittsburgh; W. H. Higgins, Wheeling Iron & Steel Co., Wheeling, W. Va.; W. E. Howes, Lackawanna Steel Co., Buffalo; H. C. Crawford, Midvale Steel Co., Philadelphia; C. L. Lingo, Inland Steel Co., Chicago, and J. L. Roney, American Rolling Mill Co., Middletown, O. The other two members are J. A. Coakley, division freight agent, the American Steel & Wire Co., Cleveland; and C. A. Muse, superintendent of transportation, the H. C. Frick Co., Pittsburgh.

Stephen J. Leonard has been elected a director of the General Foundry Co., 90 West street, New York, succeeding W. L. Kluttz, resigned.

W. Frank Roberts, who early in 1916 was made vice president of the Bethlehem Steel Co., in charge of operations at South Bethlehem, Pa., has been made manager of the Maryland plant at Sparrows Point to succeed F. W. Wood, who retired recently, but who will continue in an advisory capacity. Mr. Roberts is one of the youngest men of the Bethlehem organization. Mr. Wood, whom he succeeds has been connected with the steel industry for 40 years and has been at the head of the Maryland plant since it was started in 1887. Mr. Roberts' business career com-

W. FRANK ROBERTS

menced at the age of 12, when he became office boy for Coxe Bros. & Co., in the anthracite coal regions. After his graduation from the mechanical engineering school of Lehigh university in 1902, he became affiliated with the Bethlehem company. Since that time, he has occupied posts of constantly increasing responsibility, and in 1914 he was made a director. Other appointments made recently by E. G. Grace, president of the Bethlehem company, to become effective immediately, are as follows: Quincy Bent, who has been general manager of the Steelton, Pa., plant, becomes vice president in charge of operations at Bethlehem; M. J. Scammell, formerly general superintendent of the Maryland plant, has been made assistant general manager of the Maryland plant; F. A. Robbins will succeed Mr. Bent as general manager of the Steelton plant, with E. F. Entwistle as assistant general manager, and the Lebanon blast furnace properties will hereafter be under the supervision of John P. Brock, general manager of the American Iron and Steel plant,

Kurt R. Sternberg, resigned recently as treasurer and general manager of the Dickinson Mfg. Co., electric molded insulations, Springfield, Mass.

D. A. Stuart has been appointed Pittsburgh district manager in charge of sales of the Sizer Forge Co., Buffalo, with headquarters at 908 First National Bank building.

Fred F. Bennett, who has been affiliated with the Daisy Air Rifle Co., has been appointed general manager of the Michigan Crown Fender Co., Ypsilanti, Mich.

D. G. McIntyre has accepted an appointment to succeed F. R. Faller, who resigned recently as general manager of the Skagit Steel & Iron Works, Sedro-Woolley, Wash.

Walter F. Kaine, secretary of T. P. Kelly & Co., New York, manufacturers of foundry facings and supplies, has been elected president to succeed the late Michael F. Kerby.

Harding Allen has been elected a director of the Merchants National bank, Worcester, Mass. He is head of Charles G. Allen & Co., iron founders and machinists, at Barre, Mass.

J. H. Bickley, mechanical engineer for 17 years of the Reading Iron Co., Reading, Pa., has resigned to accept the position of superintendent of inside engineering for the Merchant Shipbuilding Corp., Bristol, Pa.

George B. Gehret, chief burgess of Bridgeport, Pa., and a member of the firm of Gehert Bros., founders, is supervising iron and construction work for the government in one of its new shipyards.

W. W. Crawford, president of the American Trust & Savings bank, Birmingham, Ala., and J. W. McQueen have been elected directors of the Sloss-Sheffield Steel & Iron Co., to fill vacancies.

G. F. Evans has been appointed resident engineer in the Ohio territory for the National X-Ray Reflector Co., Chicago, with headquarters

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

in the Columbus Savings & Trust building, Columbus, O.

H. O. Price is now affiliated with the Iron & Fuel Trading Co., First National Bank building, Pittsburgh, having resigned his position in the Cleveland office of the E. C. Humphrey Co.

Asa A. Weimer of the Weimer Machine Works, Lebanon, Pa., who is serving his second term in the Pennsylvania state legislature, is being urged as a candidate for the Republican gubernatorial nomination in Pennsylvania.

H. G. Gibson has accepted the promotion to the position of sales manager of the Clarendon Refining Co., Oliver building, Pittsburgh. He succeeds W. E. Weidler, who is serving the United States in the ordnance department.

Robert L. Lake, in charge of purchasing and traffic regulation for the De La Vergne Machine Co., New York City, has resigned to accept a position as purchasing agent at the Alexandria, Va., plant of the United States Steamship Co., Inc.

Chas. A. Swan, formerly superintendent of the Becker Steel Co. of America, has become affiliated with the sales organization of the Hess Steel Corp., Baltimore, Md. He will have charge of the Cleveland and Detroit territory.

P. C. Gunion, affiliated with the sales department of the Hyatt Roller Bearing Co., Newark, N. J., and later manager of that company's Pittsburgh office, has been made advertising manager of the industrial bearings division at Newark.

Stanley D. Winger, formerly associated with the Prest-O-Lite Co., in charge of railroad sales, has been made general manager of the compressed acetylene department of the Oxweld Railway Service Co., with offices in Chicago. He was educated at Ohio State University.

Charles C. Gorsuch was recently reelected chairman of the board at the recent annual meeting of the Savage Mountain Fire Brick Co., Frostburg, Md. John A. Caldwell remains president for another year and W. F. Caldwell is secretary. These officers with H. G. Caldwell and G. A. Shuckhart, serve as the board of directors.

Henry R. Moore, traffic manager of the Republic Iron & Steel Co., has been named the Youngstown, O., representative of the American Iron and Steel institute's subcommittee on traffic and transportation, which will have charge of making daily reports to Director General of Railroad McAdoo on carrier conditions.

Paul Wright, for the past three years sales engineer for the American Cast Iron Pipe Co., Birmingham, Ala., has resigned to accept the position of assistant chief engineer of the Fairfield works of the Tennessee Coal, Iron & Railroad Co., Birmingham. No announcement has been made regarding his successor at the pipe plant.

Frank W. Baillie, president of Canadian Aeroplanes, Ltd., Toronto, Ont., has received the title of Knight Commander of the Order of the British Empire in recognition of his services. As president of the Canadian Cartridge Co., Hamilton, Ont., he returned to the government a large sum representing his company's profits on a war order.

Joseph N. Pew Jr. has been elected president of the Sun Shipbuilding Co., Chester, Pa. His brother, J. Howard Pew, who has been that company's president, takes his position as vice president. J. A. Sims resigned as manager of the hull construction department of that company recently to become affiliated with a new shipyard in Portland, Oreg.

C. W. Bonfield, who for 10 years was connected with the machine tool house of James R. Kelly & Co., Leeds, Eng., acting as that company's representative in this country for about two years, now has charge of the new machinery department of the W. F. Davis Machine Tool Co., New York City. C. W. Westphal has been transferred from the Cincinnati office to the New York office of the W. F. Davis Co.

Franz Wollaeger Jr., has been granted leave of absence by the Kempsmith Mfg. Co., Milwaukee, Wis., of which he is secretary, so that he may enter active service as a member of base hospital No. 22, Milwaukee, which has been ordered to report for duty and which expects to sail within three weeks. Peter Lowe, sales manager and assistant secretary of the company, will assume Mr. Wollaeger's duties for the present.

J. H. Hackenburg has been promoted from the position of assistant purchasing agent to succeed the late H. J. Gearhart, as purchasing agent for the Pressed Steel Car Co., Pittsburgh. H. B. Fisher and C. C. Clark are now assistant purchasing agents; W. C. Howe, formerly in charge of the Allegheny plant, has been made assistant to the vice president, and J. C. Ritchey has been appointed electrical engineer.

S. A. Newman was elected president and treasurer of the Ohio Iron & Metal Co., First National Bank building, Chicago, upon the recent resignation of Samuel Deutsch and Moise Dreyfus, who founded the business 33 years ago. L. J. Newman was made vice president and L. Robechek secretary. B. L. Newman has charge of the Cleveland office, Citizens building, and J. M. Zehner has charge of the Montreal, Que., office, in the Transportation building.

F. M. Nourse, formerly associated with the Electrical Engineers Equipment Co., Chicago, in an important capacity is now technical writer in the advertising department of the Cutler-Hammer Mfg. Co., Milwaukee. After graduating from the University of Illinois with the class of 1912, he held several positions and in 1915 took charge of the Portage, Wis., division of the Wisconsin, Power, Light & Heat Co., where he remained until he located in Chicago.

R. A. Van Houten has been appointed vice president and general manager of the Sellers Mfg. Co., Chicago, railway materials. He was formerly works manager. George M. Hogan, formerly sales agent, has been promoted to be assistant secretary and W. H. Siegmund, cashier, has been made assistant treasurer. E. M. Kerwin, the company's secretary-treasurer, has been granted leave of absence to enter military service as captain in the ordnance department.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Fuel Order Shocks, Then Reassures

WALL street received with dismay the first shock of the fuel administration's closing order. Stocks recorded net declines of one to two points. Protest against enforcement of the ruling were widespread. But gradually a different feeling began to prevail. The expressions of confidence in the government's judgment in this matter by such financial leaders as J. P. Morgan had great weight in the market. The street felt that there must be some reason, unknown to the public, for the government's drastic action. For example, many felt that the need of the hundred or more vessels in New York for bunker coal might have justified the order. In any event, the market failed to break after the initial selling and the week closed with net advances, as a rule. Some of those who had criticized the order most sharply at first, after the first of the workless days had passed, expressed the new view that production would be increased in the last analysis through the benefits of transportation which might accrue from the shutdown. This optimism was increased by the exemption of iron and steel manufacturers, copper refiners and other essential industries from the order.

Widespread criticism, however, was expressed with regard to the fuel administration's stand on the payment of wages on the workless days. For example, the fact that many contracts are taken on a narrow margin, with wages a big item in costs, would cause actual losses, and in many cases possibly insolvency, if the employer would undertake to pay wages on 13 workless days. Many employers, as well as employes, are living from hand to mouth these days. Consequently, Wall street felt that the fuel administration, in trying to shift the responsibility of some of the ill effects of its drastic order, was working an injustice upon employers.

Many employers, however, have shown the utmost inclination to assist their workmen in every possible manner so far as they could without embarrassing themselves financially. Some companies are advancing their employes their wages as usual and will take a refund from overtime wages when normal work is resumed. Other companies have loaned their employes the amount of their usual wages, to be deducted at the rate of 5 per cent each subsequent week until the amount is paid back. Many such plans have been adopted to lessen as far as possible the hardships caused by the enforced shutdowns.

The New York financial district has talked of little other than the fuel administration's order during the past week, but at no time has the stock market lost sight of the next government war loan. Conjecture already is being made as to the date of issue of the next loan, its probable amount and rates of interest. When the final installment on the issue of 4 per cent bonds was paid, the price of that issue dropped to 96.08, the lowest figure ever touched. It is generally believed that the next issue will carry a rate of 4½ per cent. The date will be determined in large measure by the financial needs of the government, but it is thought that arrangements will be undertaken for the next loan in the near future.

Foreign Holdings of Steel Again on Increase

That the foreign liquidation of American securities, which after the outbreak of the war assumed such large dimensions, has been checked, would seem to be evidenced by the fact that holdings abroad of United States Steel common stock increased during the quarter ended Dec. 31, 1917. At the close of the quarter these amounted to 484,190 shares, a gain over Sept. 30 of 7081 shares. While the foreign holdings are a long way from the ante-bellum high mark of over 1,250,000 shares, it is the first increase since the outbreak of hostilities in August, 1914. On June 30, 1914, 1,274,247 shares or 25.07 per cent of common and 312,832 shares or 8.68 per cent of preferred, were held by residents of foreign countries. At the beginning of the war, liquidation commenced and continued until September, 1917, when but 477,109 shares or 9.39 per cent of common were held. Preferred stock showed a much smaller gain, since holdings Sept. 30 totaled 140,038 shares and this increased to 140,077 by Dec. 31, 1917. Considerable decline is shown by the complete 1917 figures, however, from the holdings of record Dec. 31, 1916. At the latter date, 9.89 per cent of common and 4.34 per cent of preferred or 502,632 and 156,412 shares respectively, were held abroad.

The following tables give the comparative holdings in foreign countries for June 30, 1914, and Dec. 31, 1917:

COMMON STOCK

	June 30, 1914	Dec. 31, 1917
England	788,512	123,074
France	68,948	30,059
Holland	356,945	229,185
Canada	43,129	41,639
Belgium	1,539	2,625
Switzerland	465	1,442
West Indies	1,810	3,690
Germany	2,633	612
Austria-Hungary	704	472
Total foreign holdings	1,274,247	484,190
Per cent of issue	25.07	9.53

PREFERRED STOCK

	June 30, 1914	Dec. 31, 1917
England	180,188	39,779
France	36,406	25,763
Holland	28,740	25,274
Canada	35,794	35,201
Belgium	773	331
Switzerland	2,540	2,848
West Indies	517	1,259
Germany	3,546	862
Austria-Hungary	586	683
Total foreign	312,832	140,074
Per cent of issue	8.68	3.88

In the common stock it is significant to note that in Belgium and Switzerland as well as in the West Indies, holdings are greater than before the war, but the gain in the last quarter is due to the increase in Canadian holdings, which grew from

33,980 shares in September to 41,639 in December.

Vulcan Steel Products is Reorganized

The Vulcan Steel Products Co., 120 Broadway announces that on Dec. 1 the syndicate headed by Gen. T. Coleman du Pont, which owns a majority of the stock of the corporation, assumed the active management of the company's affairs, Otto Kafka, who for a time served as president and manager, having relinquished his connection with the corporation. The board of directors of the company as reorganized includes Le Roy W. Baldwin, Lewis L. Dunham, T. Coleman du Pont, Frank H. Hitchcock, Stuart McNamara, R. D. Ward.

Funds Are Advanced

To facilitate construction of ships, Uncle Sam has become a money lender. Chairman Hurley recently announced that the United States shiping board will lend $5,000,000 to the Bethlehem Steel Co., to be used in housing men at the great shipyards at Sparrows Point, Md. The city of Baltimore will advance $700,000 additional for the same purpose and both loans will bear interest at the rate of 4 per cent, payable in 15 years. An advance was recently made by the government to the Newport News Shipbuilding & Drydock Co., Newport News, Va., amounting to $1,200,000 to meet this housing problem.

Republic Has Best Year in Its History

Earnings from operations during the last 12 months of the Republic Iron & Steel Co. show the best year in the history of the company. A summary of results shown by the final quarterly report gives the net revenue as $29,071,907. This is $12,527,271 in excess of the previous high record of 1916 which was $16,544,635. An excess profit tax reserve of nearly $10,000,000 was set aside last year and this left $17,902,288 for dividends. With no excess profits tax in 1916, $14,802,288 was the dividend aggregate and the balance available for common stock dividends in 1917 was equal to nearly $60 per share as compared with $36.60 the year before.

Of the four quarters, the final made the poorest showing, net earnings for it being $5,398,695. In the previous quarter ended Sept. 30, $8,697,465 was the total. The fixation of steel prices by the government undoubtedly was the cause of the decline. The following table shows the comparative annual earnings for the two years, as compiled from the company's quarterly statements:

	1917	1916
Net earnings	$28,710,683	$16,544,636
Income from inv.	361,224	348,577
Gross income	29,071,907	16,893,212
Depreciation, etc.	2,273,832	1,245,313
Bond interest	759,325	858,737
Excess profit tax	9,936,462	.....
Net income	17,902,288	14,789,163
Preferred dividend	1,750,000	*4,500,000
Common dividend	1,631,460	407,865
Surplus	14,520,828	9,881,298

*Including arrearage payments.

The December quarter brought a balance available for the common stock of $2,519,249, equal to 9.3 per cent on the junior shares, or at the rate of 37 per cent for a year. The surplus for the final three months was $2,111,384 after dividends had been paid. Unfilled orders at the end of the year aggregated 418,943 tons, a decrease of 73,105 tons from the bookings three months previous.

Financial Crop Ends

A report of the condition of the American Brake Shoe & Foundry Co., as of Dec. 11, filed with the Massachusetts commissioner of corporations, shows cash and debts receivable, $4,429,733; surplus, $7,244,165; reserve, $825,036, and total assets and liabilities of $20,302,883.

* * *

The corporate name of Trimble, Mudge & Co., scrap dealers, 1330-1335 Oliver building, Pittsburgh, has been changed to the H. N. Trimble Steel Co. The officers of the company are H. N. Trimble, president and treasurer; W. H. Barr, vice president and secretary and J. H. Gilmore, assistant treasurer.

* * *

In a pronouncement addressed to President Wilson, members of the cabinet and the council of national defense, the credit defense committee of the National Association of Credit Men urges uniform and adequate systems in all purchasing departments that will permit the prompt payment of all obligations to private concerns for war contracts.

* * *

During December, loans aggregating $9,309,959 were paid out to farmers of the United States by the federal land banks on long-time first mortgages. Since the establishment of these banks a total of $39,112,115 has been paid out in 18,154 loans, while applications for $243,622,295 have been filed. The total amount of loans approved was $125,500,406.

* * *

Annual meetings of the Norton Co., and Norton Grinding Co., Worcester, Mass., were held Jan. 15. The following officers were elected to serve for both corporations: George I. Alden, president; Charles L. Allen, treasurer and general manager; and Aldus C. Higgins, secretary and general counsel. These with the following will serve as the board of directors for the above companies: John Jeppson, George N. Jeppson and R. Sanford Riley.

Business Let-Up

Has Little Effect on Production of Coal Tar Products

New York, Jan. 22.—Producers of sulphate of ammonia have been notified by Dr. Charles W. Merrill, chief of the division of chemicals of the food administration, Washington, that licenses and forms covering the sale of this product are being distributed. In the meantime, the market practically is at a standstill and efforts are restricted to getting out shipments. It is extremely difficult to make deliveries due to the railroad congestion. This situation applies to all coal tar products. It is not expected that the general cessation of manufacturing from Jan. 18 to 23 will have much effect upon the output of coal tar products since by-product coke plants have continued to operate.

Normal business in benzol was transacted this week. A number of fair-sized contracts were closed. The market on pure benzol continues at 35 to 40 cents per gallon, both for spot and contract. This product displays a slightly stronger tone due to reduced production resulting from the coal shortage.

No toluol yet has been released by the navy department to the general trade. No assurance yet has been received that such releases will be granted, and there again are some misgivings. Solvent naphtha displayed a fair amount of business this week with the market unchanged at 18 to 22 cents per gallon both for spot and contract. Phenol, of which the output is sold practically through the first quarter, shows no new business. The market continues strong at 53 to 55 cents per pound for spot shipment, with the contract market nominal.

Coke Oven By-Products

Spot

Per Gallon at Producers Plant

Pure benzol	$0.35 to .40
Toluol (nominal)	1.70 to 1.80
Solvent naphtha	.18 to .22

Per Pound at Producers Plant

Phenol	$0.52

Per 100 Pounds at Seaboard

Sulhate of ammonia (nominal)	$4.90 to 5.00

Contract

Per Gallon at Producers Plant

Pure benzol	$0.35 to .40
Toluol	nominal
Solvent naphtha	.18 to .22

Per Pound at Producers Plant

Phenol nominal.

Per 100 Pounds at Seaboard

Sulphate of ammonia.....nominal

Tool Plants Closed By Fuel Order

Builders Engaged in Producing Equipment for Shipyards Alone Are Exempted—Repair Shop Equipment for Destroyers Soon to be Purchased—Pittsburgh and Chicago Machine Tool Markets Quiet

MACHINE tool builders, except those engaged in the production of shipyard equipment, have not been exempted from the general order of the fuel administrator requiring plants to be closed at stated intervals. Some doubt exists in the industry whether this was a wise expedient or not. Steady progress in the nation's destroyer program is reflected by the recent inquiry of an eastern builder for 85 precision lathes to be used for destroyer repair shop equipment. With the destroyer program so well along that inquiries are being made for ship-outfitting tools, it is believed that a goodly number of initial difficulties have been ironed out.

Shipbuilders, as well as the government, still are asking for tools. These inquiries, emanating mostly from the east, have included one lot of 30 lathes; a second lot of six lathes to have from 18 to 86-inch swing and a third lot of 12 lathes. Crane inquiries from the same sources are of large volume and call for electric traveling cranes for the most part. One large order for 28 locomotive cranes was placed during the week by an eastern builder.

Deferred deliveries have contributed to a general lack of interest on the part of buyers in the Pittsburgh and Chicago districts. Other unfavorable influences in these districts are considered to be the high prices now being asked for tools; delayed shipments of steel and fuel, and pressing labor problems. Considerable support is being given by manufacturers to the appeal made by the ordnance department to producers of nonessential products, for machinery for ordnance requirements, even at this early time.

Brisk Buying of Tools in Small Lots Continues

BUILDERS of machine tools were generally affected by the closing order of the fuel administrator, shutting down their plants on the morning of Jan. 20. An exception, however, was made in the case of manufacturers making machines needed by shipbuilders, who continued operations as usual. As the production of machine tools at present is one of the most essential war industries, owing to the need for machines to turn raw materials to war purposes the loss of five days is a serious setback. On Friday, builders were anxiously endeavoring to obtain exemptions from the order

Inquiry for machines continues active, although, as in the recent few weeks, buyers are scouring the market, trying to pick up machines here and there, rather than futilely issuing long lists. However, a few lists are coming out constantly. The Federal Ship Building Co., 54 Dey street, New York, is inquiring for 30 to 40 lathes, of various sizes. The Brooklyn navy yard is inquiring for a half dozen lathes, ranging in size from 18 to 86-inch. It develops that the 85 lathes for which the Fore River Shipbuilding Corp., Quincy, Mass., is inquiring, are small precision lathes for tool room equipment aboard destroyers. The Watervliet arsenal, Watervliet, N. Y., is inquiring for about 12 additional machines, including lathes and grinding machines. The Neptune Meter Co., Long Island City, N. Y., has been buying tools, which are understood to be against a fuse contract. The ordnance department of the United States army, at Washington, has issued a long list, including 500 planers, several hundred engine lathes and some horizontal and vertical milling machines, which it will need within the next two months. It is asking not only builders and sellers, but users as well, to co-operate with the government in supplying these tools, which are urgently needed for the production of heavy guns. The Watson-Stillman Co., 50 Church street, New York, has closed for practically all of the $100,000 worth of general shop equipment needed to start work on a contract for hydraulic jacks for 9.5 guns. Carpenter & Wooward, machinery dealers, 233 Broadway, New York, are liquidating machines from the Long Island plant taken over by the government from the estate of J. K. Stewart. The machines are all new, most of them never having been set up. Of a total of about $250,000 worth of machines, about $100,000 worth remains to be disposed of. The remainder consists of general machine shop equipment.

Several large orders are being placed in the New York crane market at this time. Among the larger of those recently placed is that of the American International Shipbuilding Corp., involving 28 locomotive cranes for its yard at Hog Island, Philadelphia. The Air Nitrates Co., New York, also has awarded 15 overhead traveling cranes, including seven 5-ton, four 20-ton and four special cranes, to three manufacturers. Negotiations for five electric cranes, ranging from five to ten tons, for the Washington navy yard are understood to be about completed. The Federal Shipbuilding Co. continues to figure on 11 electric cranes. The American Shipbuilding Co., which is erecting a yard at Alexandria, Va., is considering the purchase of several locomotive cranes and other miscellaneous equipment. This company closed last fall on a portion of its machinery requirements. Dutilk-Smith, MacMillan & Co., New York, are inquiring for one 10-ton electric crane for shipment to Argentina. The Alliance Shipbuilding Co. recently was incorporated in Delaware with $5,500,000 capital. According to reports, it will build a plant at Camden, N. J.

War Orders Furnish Only Buying Stimulus

BUYING of machine tools in the Chicago district has been decidedly interfered with by storm conditions, which have prevented the movement of freight and by other uncertainties in the market. Since the beginning

It's YOUR Steel All the Way Through

EVERY order for AGATHON Steel is "individualized" from the moment it enters our offices.

In other words, the USE to which YOU are going to put the steel is constantly in the minds of the men who create and handle it, from furnaces to shipping shed.

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The Hamill-Hickox Company,
District Representatives.

Chicago Office:
1370 Peoples Gas Bldg., 122 So. Michigan Blvd.
C. H. Beach, District Sales Manager.

Philadelphia Office: 603 Widener Building.
Frank Wallace, District Sales Manager.

Syracuse Office: 61 University Block.
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"AGATHON" Nickel Steels
"AGATHON" Special Analyses
"AGATHON" Vanadium
"AGATHON" Chrome Steel
"AGATHON" High Carbon

Say you saw it in THE IRON TRADE REVIEW

of the year this lack of business has been noted and some dealers believe it is becoming intensified as time passes. Aside from companies having large government contracts for ordnance and shells, comparatively little activity is noted. Owners of small machine shops feel they are unable to pay present prices, especially in view of the fact that deliveries are almost monopolized by priority orders given to those who have government work. Even second-hand equipment is difficult to obtain and costs about as much as new machinery. Government and other orders recently placed have caused deliveries to be set back considerably. Advances continue to be made by various manufacturers, and a recent increase of 5 per cent on certain makes of screw machines has been announced. The W. Schuler Machine Co., Chicago, will build a machine shop. The McLaughlin Coal Reduction Co., Decatur, Ill., has plans ready for a machinery manufacturing plant. The Safety Signal Co., Peoria, Ill., is building a plant for the manufacture of tools and appliances. The Schultheiss Co., San Diego, Cal., is building a machine shop and foundry at Los Angeles. The Baker Iron Works, Los Angeles, is building a foundry. The war plant of the Standard Steel Car Co. at Hammond, Ind., will be 250 x 800 feet in size. The Hamilton & Beach Mfg. Co., Racine, Wis., is building a large addition. The Murray-Mylrea Machine Co. at Antigo, Wis., has bought two existing plants which will be further equipped. The Glenrock Foundry & Machine Co. at Glenrock, Wyo., is building a foundry.

Demand for Used Tools Grows Large

USED machine tools are being eagerly purchased in the Cleveland market by manufacturers in need of equipment. Outstanding in the week's news are a number of inquiries covering a wide range of tools from scattered sources. Dealers' activities are limited only by their ability to secure tools. An inquiry has been issued by the Cleveland City Forge & Iron Co., Cleveland, for one 42 to 50-inch gap lathe, two milling machines and one shaper. The Dayton Engineering Laboratories Co., Dayton, O., requires equipment inclusive of the following: Two sensitive bench drilling machines; one forge with 12-inch blower; one forge with water tank and blower, and one 8-inch internal grinder. Prices on a lathe, a shaper and a grinder are desired by the Acme Electric & Machine Co., Ajax building, Cleveland. The Universal Bottle Washer Co., Cleveland, is inquiring for a 12-inch, a 16-inch and an 18-inch x 8-foot lathe. Machine tools of the following types are desired by the Star Tool Co., Springfield, O.: One 20-inch used back-geared shaper and one 20-inch back-geared drill press. The Detroit Shipbuilding Co., Detroit, Mich., is in the market for one 6-foot vertical boring mill. Prices on one 4½-foot to 6-foot plain radial drill are requested by the Buffalo-Springfield Road Roller Co., Cleveland. The Glenn L. Martin Co., Cleveland, has issued an inquiry for one geared-head milling machine and one 30-inch punch press. Several 24-inch shapers and one bench lathe will be purchased by the Aluminum Castings Co., Cleveland.

Work on Government Crane Jobs Suspended

A check has been placed upon builders of heavy machinery—cranes, dock machinery, ore and coal handling equipment—in the Cleveland district, by the edict of the fuel administrator. Some builders state frankly that they are puzzled at the closing order, since 95 per cent of their production is going to the government. They are unanimous in their decision to obey orders, however. Small orders are being placed from time to time, although the current of inquiries shows considerable slackening. One 75-ton shipbuilding crane is under construction for the Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia.

Deferred Deliveries Discourage Buyers

INQUIRIES in the Pittsburgh district for machinery and machine tools have fallen off. This is attributed chiefly to the impossibility of buyers getting satisfactory deliveries, although high prices are undoubtedly a factor in the situation. Makers have had extreme difficulty in securing shipments of steel on account of the traffic congestion and entertain hope that the fuel saving order of Fuel Administrator Garfield will result in bringing about relief. Government orders continue to be heavy.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Along the Middle Atlantic Seaboard

ALBANY, N. Y.—The foundry of G. H. Thatcher & Co., producer of gray iron castings, Learned and Thatcher streets, will be rebuilt; the plant was damaged by fire in April with a loss of $75,000.

BROOKLYN, N. Y.—A charter of incorporation has been granted to David H. Smith & Son, capitalized at $100,000 to manufacture iron and steel products and hardware. Incorporators include D. H. Smith, M. F. Smith and J. C. Snyder, 256 Broadway.

BROOKLYN, N. Y.—A charter of incorporation has been granted to the Gregory-Gibbs Ordnance Co., capitalized at $30,000. The incorporators are W. G. Ivie, G. W. Gibbs and T. M. Gregory, 263 North Henry street.

BUFFALO.—The Oldman Boiler Works, 38 Illinois street, is having plans drawn for a 1-story, 50 x 100-foot addition to its plant. W. H. Zawadski, 798 Gilmore avenue, is architect.

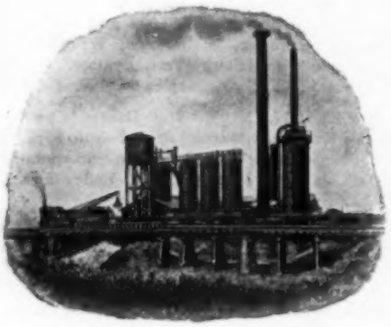
JAMESTOWN, N. Y.—The Gurney Ball Bearing Co. has awarded to the Jamestown Construction Co. the general contract for a $20,000, 1-story, 20 x 256-foot plant addition.

LONG ISLAND CITY, L. I., N. Y.—The Akron Tire Co. is having plans drawn for the erection of a $12,000 factory building at Honeywell street and Skillman avenue. The new building will be 1-story high and 50 x 95 feet in size. Steines & Ludwick are architects.

MONTOUR FALLS, N. Y.—The Shepard Electric Crane & Hoist Co., which has recently increased its capital from $500,000 to $1,000,000, plans to build an addition to its plant.

NEW YORK. — The Smuggler Extension Corp. has been chartered with a capital of $25,000 to conduct a mining and smelting business. Incorporators include J. L. Tilton, D. and M. Hyman, 61 Broadway.

NEW YORK.—T. Paulson & Son, Inc., have awarded the contract for the erection of a



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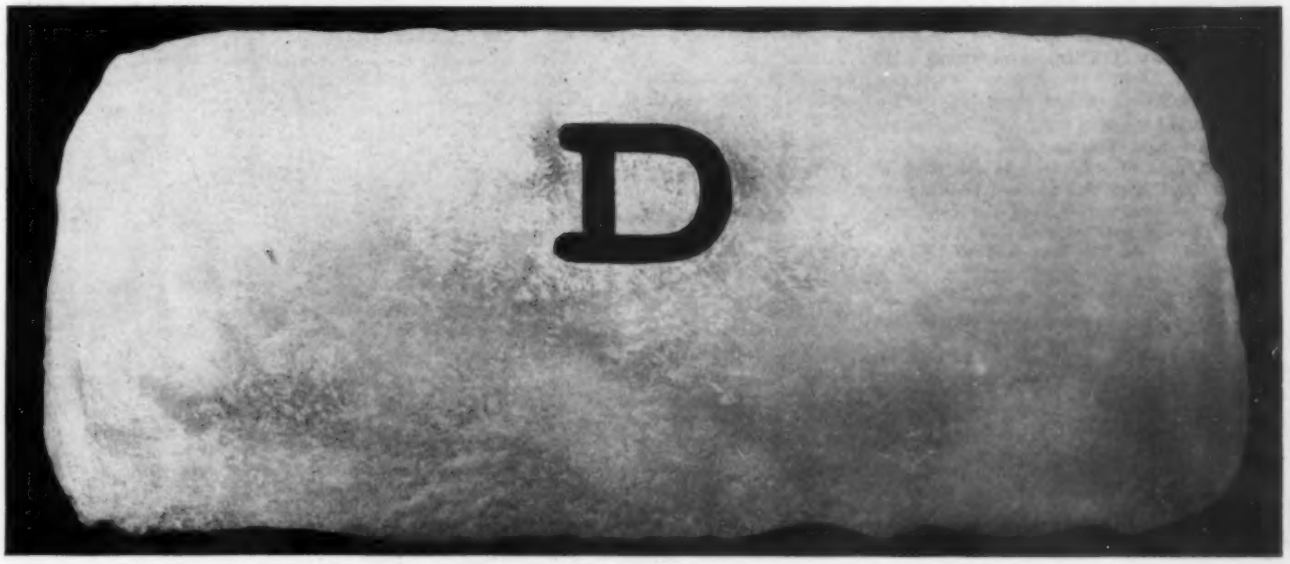
DELAWARE

DELAWARE RIVER STEEL COMPANY



2-story, 35 x 39-foot brick foundry to cost $6000.

NEW YORK. — The Consumers Tire & Rubber Corp., recently incorporated with $100,000 capital, plans to build a plant. Incorporators of the company are N. M. Blackley, E. D. Reecks and A. R. Aboud, 275 Eighty-sixth street.

NEW YORK.—The Liberty Steel Products Co., Woolworth building, is in the market for plate and angle shop equipment.

ROCHESTER, N. Y.—The Gleason Works, 1000 University avenue, manufacturer of gears and gear cutting machinery, plans to erect a 1-story, 75 x 80-foot addition to its factory. Cost is estimated at $12,000.

ROCHESTER, N. Y.—The Atlantic Stamping Co. has awarded contracts for a $5000, 1-story, 66 x 98-foot factory addition. The company has recently awarded contracts for a 2-story, 86 x 111-foot building for the manufacture of metalware.

EASTON, PA.—The F. S. Bixteler Co., 126 South Third street, is taking bids on a 1-story factory, 57 x 112 feet, to cost $12,000.

GIRARD, PA.—The plant of the A. M. Byers Co., manufacturer of pipe, was damaged by fire Jan. 9 with a loss of $15,000.

HARRISBURG, PA.—Contract has been awarded to the Austin Co., 14230 Euclid avenue, Cleveland, for the erection of a steel and concrete factory for the Harrisburg Pipe & Pipe Bending Co., to replace that damaged by fire recently. Cost is estimated at $95,000. W. T. Hildrup Jr., vice president of the company, is in charge. The new building will be 100 x 420 feet, equipped with steel sash.

JOHNSTOWN, PA.—The benzol plant of the Cambria Steel Co. has been damaged by fire with a loss of $25,000.

KITTANNING, PA. — The Carbon Steel Co., which has recently purchased the plant of the Kittanning Iron & Steel Co., plans additions to consist of two open-hearth furnaces.

LANCASTER, PA.—The Champion Blower & Forge Co. has awarded the contract for the erection of an addition to its plant, to be 50 x 100 feet.

LEWISTOWN, PA. — The Belmont Motor Co., Union Trust building, Harrisburg, Pa., will build a new factory. G. G. Gochnaur is president.

McKEESPORT, PA.—The National Tube Co. plans the erection of a plant costing about $1,000,000 to be used in the manufacture of munitions.

PHILADELPHIA.—The Chester Iron Co. has been incorporated with $50,000 capital by Allen R. Hoffer.

PHILADELPHIA.—The Standard Concrete Machinery Co. will take bids shortly on the construction of three factory buildings, each one story high, to cost jointly $25,000. C. J. Langlee, 821 Fulton building, is in charge.

SCRANTON, PA.—Contracts for extensive shop improvements have been awarded by the Erie railroad.

UNIONTOWN, PA.—The Uniontown Foundry Co. has been organized with a capital of $10,000. E. R. Floto is in charge of the company.

WHITE HAVEN, PA.—The Wilmot Engineering Co., iron and steel castings, has had plans prepared for the erection of a machine shop, power house and pattern shop.

WILLIAMSPORT, PA.—The foundry and pattern department of the plant of the National Foundry & Mfg. Co. have been damaged by fire Jan. 12 with a loss estimated at $40,000. The company has been working on government contracts.

YORK, PA.—The York Hardware & Brass Co., Wheatfield and Commerce streets, has purchased the former plant of Billmeyer & Small, which it will equip for the manufacture of bronze and aluminum castings.

JERSEY CITY, N. J.—Fire recently damaged the chair factory of the Joseph Partrige & Sons Co., causing a loss of about $150,000.

JERSEY CITY, N. J.—The G. W. Bradley Axe & Tool Mfg. Co., recently chartered with $10,000 capital, will build a factory. G. W. Bradley, Weston street, Westport, Conn., is interested.

NEWARK, N. J. — The Hayden Utilities Corp. has been granted a charter of incorporation to manufacture machines. The company is capitalized at $50,000 and its incorporators are Henry A. Hayden, Westfield, N. J.; Edward J. Hunt, West Orange, N. J.; and George C. Cook, Maplewood, N. J.

PATERSON, N. J.—The Barnes Chemical Works, Inc., has been chartered with $250,000 to manufacture chemicals. The incorporators include John W. Laffey, H. J. Laffey and L. E. Laffey.

PEARL RIVER, N. J. — A charter has been granted to the American Stove Corp., organized with $100,000 capital by Paul E. Fritsch, Brooklyn, N. Y.; Cornelius A. Cole, Hackensack, N. J., and Arthur A. Oakley, Pearl River.

SKILLMAN, N. J.—The Philadelphia & Reading railroad is receiving bids for the construction of a $30,000 power house and signal tower. A. T. Dice, Reading terminal, Philadelphia, is president.

TRENTON, N. J.—The Gulf Refining Co. has taken out a permit for an addition to its Princeton avenue plant, to cost $7000.

WILMINGTON, DEL. — The B. E. Shaw Co., Second and Lombard streets, manufacturer of steam fittings, will build a 1-story, 50 x 268-foot addition to its plant, to cost $41,000. Contract has been awarded.

BALTIMORE.—The plant of the American Propeller Co., Light and Poultney streets, has been damaged by fire with a loss of $100,000, partly covered by insurance.

CURTIS BAY, MD. — The Chesapeake Shipbuilding Co. has secured an option on a 75-acre tract on which it contemplates erecting a shipbuilding plant.

HAGERSTOWN, MD.—The Pangborn Corp., manufacturer of sand blast equipment, is receiving bids on the construction of a 100 x 150-foot foundry building and a 60 x 100-foot machine shop addition. The structures will be of reinforced brick with metal sash.

NORFOLK, VA.—The Marine Iron Works has been incorporated with a capital of $50,000. B. O. Colonna is president and W. B. Drewry secretary of the new company.

Activities in the Central States

GREEN BAY, WIS.—Architect C. H. Kane, of Swift & Co., Chicago, is preparing plans for a 2-story brick, frame and corrugated iron warehouse addition, to cost about $25,000.

JANESVILLE, WIS.—Joseph Denning has been awarded the contract for erecting two shop additions, 30 x 60 feet, to the plant of the Townsend Mfg. Co., gas and kerosene engines, tractors, etc. Most of the equipment needed for the improvement has been contracted for. R. B. Townsend is general manager.

MADISON, WIS.—The Southern Wisconsin Foundry Co., Pennsylvania avenue, has awarded the contract for a 50 x 200-foot foundry to cost $15,000.

ROYALTON, WIS.—The machine shop of James A. Haire, manufacturer of gasoline engines, has been damaged by fire with a loss of $7000.

STURGEON BAY, WIS.—Articles of incorporation have been filed by the Universal Shipbuilding Co., capitalized at $1,500,000. Philip Binzel, Theodore Froemming and Hubert Reisen are incorporators.

WRIGHTSTOWN, WIS.—Bids will be received shortly by the county commissioners for a reinforced concrete bridge with a 70-foot span and 20-foot roadway, to cost $7500. M. M. Torkelson, Madison, Wis., state engineer, is in charge.

DETROIT.—The Service Pattern & Mfg. Co. has organized with $35,000 capital to make wood and metal patterns and to do a machine shop business. The incorporators are Stanley Leech, C. I. S. Pulleyblank and H. E. L. Pulleyblank.

GRAND RAPIDS, MICH.—The Grand Rapids Varnish Co., Wallace E. Brown, president, has had plans prepared for an extension to its plant.

JACKSON, MICH.—The plant of the Perlman Rim Co., recently damaged by fire, will be rebuilt. G. S. Porter is in charge.

MARQUETTE, MICH.—Plans are being prepared for the erection of an addition to the municipal waterworks system, to cost $75,000. Address city engineer.

MENOMINEE, MICH. — The Menominee Electric Mfg. Co. is receiving bids on the erection of four 1-story additions to its plant, to cost jointly about $60,000.

CHICAGO.—The W. Schuler Machine Co., 200 Ann street, will build a 1-story brick and concrete machine shop to cost $20,000. Davison & Weiis, 53 West Jackson street, are architects.

DECATUR, ILL. — The McLaughlin Coal Reduction Co., recently organized with a capital stock of $25,000, will build a factory to manufacture machinery. The incorporators of the company include W. L. McLaughlin, L. W. Winchester and W. Williams.

MATTOON, ILL.—The Clark Meter Co. has had plans prepared for a one and two-story foundry to cost $50,000.

PEORIA, ILL.—Plans are being prepared by Reeves & Baillie, architects, for a tractor plant to include six units, consisting of thirteen buildings, to be built by A. E. Rosenthal, 122 South Michigan avenue. Cost is estimated at $175,000.

SOUTH CHICAGO, ILL. — The Iroquois

OHIO STEELS

Out in the wheat fields of the Great Northwest, where they harvest the Nation's grain, time is just as important as in the busiest factory.

Plowing, planting, reaping, threshing must be done on Nature's schedule. Mistakes or loss of time can never be made up. It is imperative that every machine and implement used be absolutely reliable.

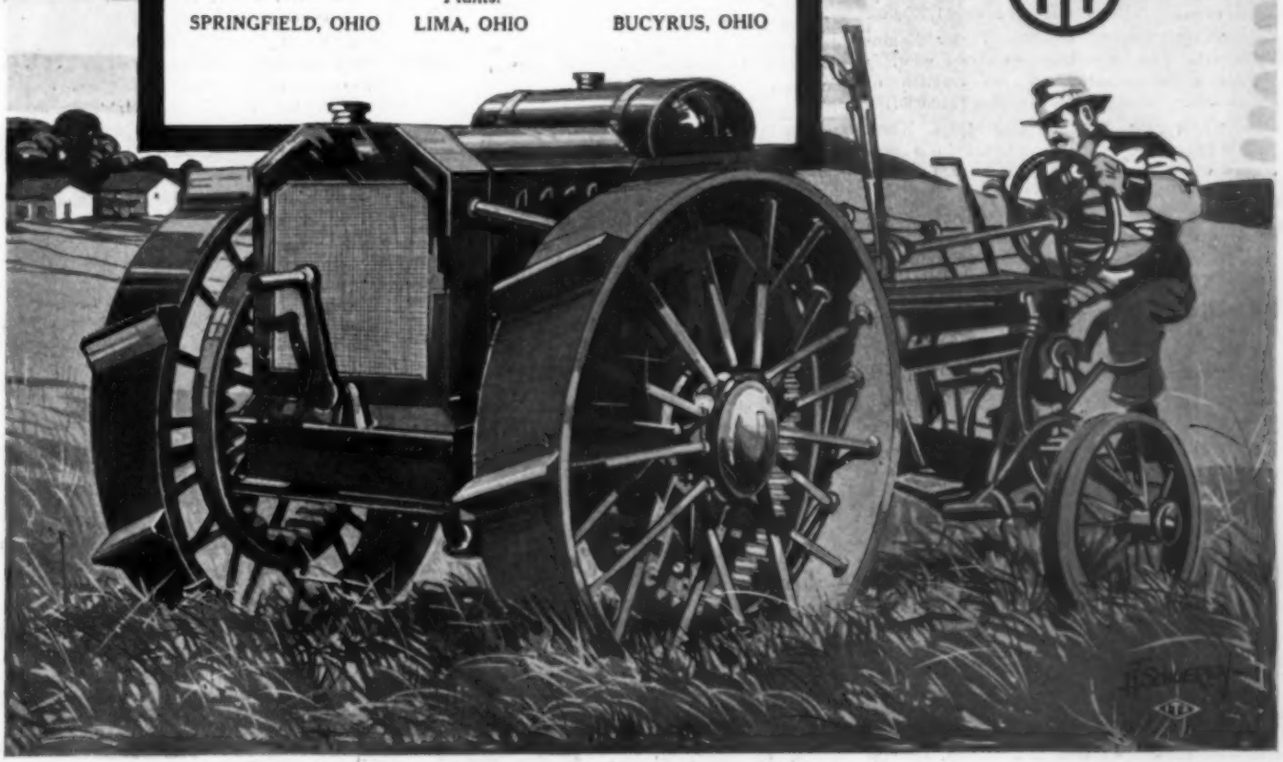
The fact that Ohio Steel Castings are sought for use in tractors and other types of farm machinery, is proof of their quality.

The Ohio Steel Foundry Co.

Plants:

SPRINGFIELD, OHIO LIMA, OHIO BUCYRUS, OHIO

Service PLUS Quality



Iron Co. will build a slag handling plant to cost $100,000.

ANDERSON, IND.—The plant of the Hayes Wheel Co. will be enlarged by the erection of several additions to provide for the execution of large government contracts which the company has recently undertaken.

HAMMOND, IND.—The United Boiler & Foundry Co., 185 Wilcox avenue, has awarded the contract for a 75 x 100-foot factory to cost about $5000.

INDIANAPOLIS.—A charter of incorporation has been granted to the Ideal Tool Works, capitalized at $20,000. The company will manufacture tools and automobile parts. Incorporators include E. L. Crum, Edward C. Klingholz, Jesse W. Titus and others.

INDIANA HARBOR, ILL.—The plant of the Inland Steel Co. has recently been damaged by fire with a loss of $10,000. J. W. Lees is superintendent of the plant.

LOGANSPORT, IND.—The core room and foundry of the Western Motor Works have been damaged severely by fire, with a loss estimated at $75,000. The company manufactures castings for the Indiana Motor Co., which is working on government contracts. A. W. Patty, manager, announces that the plant will be rebuilt shortly.

VINCENNES, IND.—The Vincennes Galvanized Iron Works has been incorporated with $10,000 to engage in a sheet metal working business. The incorporators include Peter R. McCarthy M. O. McCarthy and John H. McCarthy.

AKRON, O.—Bids will be received shortly by Franz C. Warner, architect, 767 Hippodrome annex, Cleveland, for the construction of a meter building, power plant and heating system to be built by the Northern Ohio Traction & Light Co., Hamilton building. The structures will be of brick, steel and concrete, three stories high, 40 x 90 and 1-story, 40 x 50 feet, respectively. Total cost is estimated at $100,000.

BEDFORD, O. — Bids will be received shortly by W. C. Owen & Co., architects, 1900 Euclid avenue, Cleveland, for the construction of a plant for the Owen Tire & Rubber Co.

BELLEFONTAINE, O.—O. Hillicker is interested in a company, recently organized with $50,000 capital, which has purchased a site on South Main street, on which it plans to erect a 2-story plant for the manufacture of automobiles.

CINCINNATI.—Plans have been prepared by Oscar Schroeder, architect, 15 East Rochelle avenue, for a machine shop and foundry building which will be erected by the Fulflo Pump Co. The cost of the new construction is estimated at $20,000.

CLEVELAND.—Bids will be taken shortly by Allen Sogg, architect, American Trust building, for a machine shop and foundry building to be erected by the Buckeye Brass & Foundry Co. The building will be of brick and concrete, mill construction, 60 x 100 feet.

CLEVELAND.—The Glauber Brass Mfg. Co., Superior avenue and East Forty-ninth street, has had plans prepared for a 7-story concrete brass manufacturing plant. The cost of the proposed structure is estimated at $250,000. The building is to be unique in that the top floor will be given over to the foundry in an effort to supply the maximum of light and air to this branch of the work. M. H. Glauber is manager of the company.

CLEVELAND. — The Western Machine Products Co., recently incorporated with a capital of $100,000, has taken over the plant formerly occupied by the Marvel Accessories Mfg. Co. at St. Clair avenue and East Seventy-third street, which it will equip for its own use.

DAYTON, O.—The Dayton Machine Products Co. has been incorporated with $10,000 capital by L. E. Hamer, F. T. Lindsey, James Saunders, E. S. Hood and Henry Grosnickel.

ELYRIA, O.—The Colson Co. has been incorporated with a capital of $300,000 to manufacture bicycles, and will build a plant. The incorporators include H. Ingersoll and A. M. Whitehead.

FOSTORIA, O.—The Hydro-Carbon Wickless Burner Co., recently incorporated with a capital of $1,000,000, will build a plant. H. J. Sommers is president.

HAMILTON, O.—Plans are being prepared by H. Mueller, architect, for a $25,000 factory to be erected by the Liberty Machine Tool Co. The structure will be 100 x 200 feet in size.

LIMA, O.—The Imperial Tool Co., which has combined with the Automatic Transmission Co., Chicago, has removed its plant here and is in the market for considerable new machinery.

New Business in Eastern Canada

NANAIMO, B. C.—The Granly Consolidated Mining, Smelting & Power Co. is having plans prepared for the construction of coke ovens. Cost is estimated at $1,500,000.

VANCOUVER, B. C.—The Taylor Engineering Co. Ltd., 850 Hastings street west, is having plans prepared for the erection of a one-story brick factory to cost $20,000.

VANCOUVER, B. C.—Major Moore, North West Trust building, is interested in a syndicate which proposes to build a shipbuilding plant.

BRANTFORD, ONT.—The plant of the Watson Mfg. Co. was damaged by fire Jan. 8, and a large amount of machinery must be replaced. Loss amounts to $30,000.

CHATHAM, ONT.—The plant of the Canadian Des Moines Steel Co. was damaged by fire Jan. 6 with a loss of about $10,000. Some machinery will have to be replaced.

CHESLEY, ONT.—The Chesley Chair Co. is in the market for several electric motors.

COPPER CLIFF, ONT.—J. C. Nichols, mine superintendent, Canadian Copper Co., is in the market for an electric pump and one alternating current motor.

DUNDAS, ONT.—John Bertram & Sons Co. will build an addition to its shell plant, to be 70 x 300 feet in size, of brick and steel construction, to cost $150,000. Contract has been awarded to P. H. Secord & Sons, Brantford, Ont.

GEORGETOWN, ONT. — The Canada Needle Works has been incorporated to manufacture needles, jacks, sinkers, machinery and tools, with a capital stock of $50,000. Frederick A. Harley, Richard I. Creelman, Georgetown, and John McMurchy, Brampton, Ont., are incorporators.

HAMILTON, ONT.—The cooperage plant of the Steel Co. of Canada, which was damaged by fire Jan. 7 with a loss of $12,000 will be rebuilt and will require new machinery.

HAMILTON, ONT. — The Hamilton Bridge Works Co., Bay street north, will build a one-story addition to its plant, to cost $20,000. W. B. Champ is secretary of the company.

STAYNER, ONT.—Joseph Knox is in the market for alternating current motors.

TORONTO, ONT.—W. H. Banefield & Sons, 372 Pape avenue, have awarded contract for the erection of a foundry to cost $5500.

TORONTO, ONT.—The Dominion Metallurgical Co. has been incorporated to manufacture iron and steel products with $250,000 capital. Howard A. Harrison, William M. Cox, William N. Robertson and others, are incorporators.

TORONTO, ONT.—The Swift Canadian Co. has awarded to the John V. Gray Construction Co. contract for a boiler house to cost $12,000.

TORONTO, ONT.—The International Ore Corp., Ltd., has been chartered to treat ores, to manufacture iron and steel products with a capital stock of $1,000,000. Directors are Howard A. Harrison, 2 Wilton Crescent, Wilfred M. Cox, William N. Robertson and others.

MONTREAL, QUE.—The Colborne Trading & Transportation Co., Ltd., has been incorporated to build ships with $2,000,000 capital stock. Frederick S. Isard, Frederick H. Markey, Waldo W. Skinner and others are interested.

MONTREAL, QUE.—The Structural Steel Co. has been incorporated to manufacture structural iron and steel with $5000 capital stock. Walter R. L. Shanks, Francis G. Bush and George R. Drennan, are interested.

MONTREAL, QUE. — The Pyrene Mfg. Co. of Canada, has been incorporated to manufacture fire extinguishers, chemical engines, fire apparatus and machines with $100,000 capital. James A. Miller, Aubrey H. Elder and Maurice C. Lalonde, are incorporators.

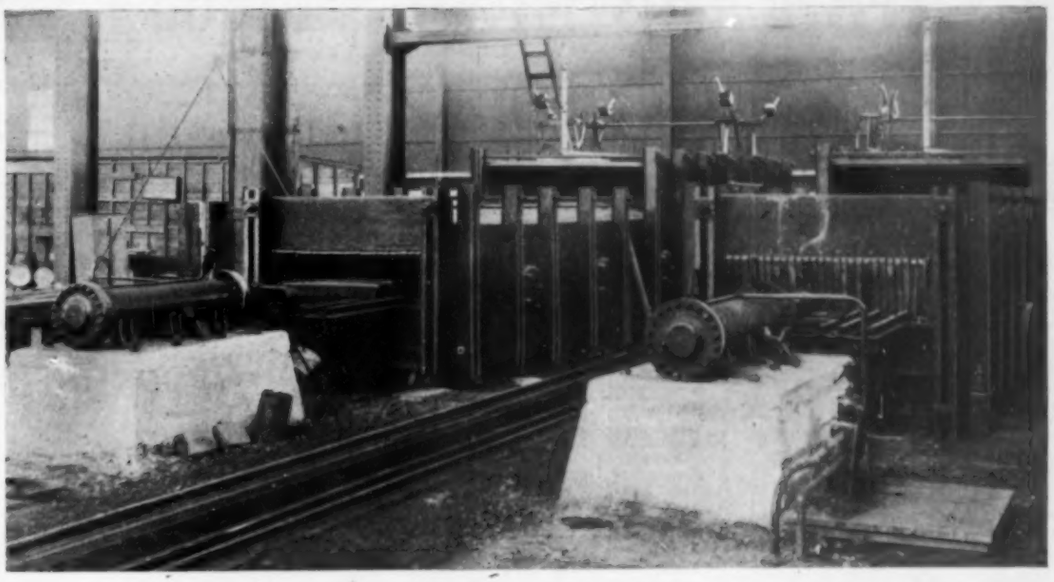
SOREL, QUE.—The St. Lawrence Shipbuilding & Steel Co. has been incorporated to build ships, engines, boilers and machinery with $1,000,000 capital stock. Peter Bereovitch, Ernest Lafontaine and Nathan Gordon, Montreal, Que., are interested.

THREE RIVERS, QUE.—Jules Caron, architect, 69 St. Francois Xavier street, is in the market for a 35-ton crane.

SYDNEY, N. S.—The Cross Fertilizer Co., Prince street, will build a mill house and engine room at a cost of $20,000, to replace the buildings recently damaged by fire

WINNIPEG, MAN.—The plant of the Winnipeg Brass & Fixtures Co. Ltd., was damaged by fire Jan. 8 with a loss to building and equipment of $13,000.

KANANASKIS FALLS, ALTA.—The Alberta Electro-Chemical Co. Ltd. will install new machinery and equipment for the manufacture of carbide. Dr. Harry Brett, Banff, Alberta, is interested.



Continuous Heating Furnaces

W-S-M Continuous Heating Furnaces afford a great saving in time and labor which is frequently expended in charging the furnace.

The Heating Furnaces shown above are used for heating blooms, billets and ingots. The pieces are fed onto a platform in front of the furnace and are pushed through the fire chamber by hydraulically operated cylinders, the heated pieces being discharged upon a roller table, which carries them directly to the rolls.

The furnaces may be fired by coal, oil, natural or producer gas.

For Steel Mill Equipment of any kind you can do no better than to specify W-S-M—used the world over.

Principal Products of The W-S-M Company

Steel Plant Equipment:
Manipulators, Furnaces, Charging Machines, etc.
By-Product Coke Oven Machinery.
Shipyard Cranes.
Hoisting and Mining Machinery.
Ore and Coal Handling Machinery.
Special Large Cranes.
Gas Producers, Gas Valves.
Hydraulic Turbines.
Johnson Hydraulic Valves.
Steel Castings.

WELLMAN SEAVER MORGAN COMPANY
CLEVELAND
OHIO U.S.A.

Say you saw it in THE IRON TRADE REVIEW

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports.	
Old range Bessemer, 55 iron	$5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05

WAREHOUSE PRICES

Steel bars, Chicago	4.10c
Steel bars, Cleveland	4.035c
Steel bars, Detroit	4.085c
Steel bars, Philadelphia	4.10c
Steel bars, New York	4.095c
Steel bars, St. Louis	4.17c
Steel bars, Cincinnati	4.085c
Steel bars, St. Paul	4.22c
Steel bars, Buffalo	4.05c
Iron bars, Buffalo	4.65c
Iron bars, Chicago	4.10c
Iron bars, Cleveland	3.985c
Iron bars, Detroit	4.75c
Iron bars, St. Louis	4.17c
Iron bars, Cincinnati	4.085c
Iron bars, Philadelphia	4.50c
Iron bars, New York	4.659c
Shapes, Chicago	4.20c
Shapes, Detroit	4.185c
Shapes, St. Louis	4.27c
Shapes, St. Paul	4.32c
Shapes, New York	4.195c
Shapes, Cleveland	4.135c
Shapes, Philadelphia	4.20c
Shapes, Buffalo	4.15c
Shapes, Cincinnati	4.185c
Plates, Buffalo	4.40c
Plates, Chicago	4.45c
Plates, Detroit	4.435c
Plates, St. Louis	4.52c
Plates, St. Paul	4.57c
Plates, New York	4.445c
Plates, Cleveland	4.385c
Plates, Philadelphia	4.45c
Plates, Cincinnati	4.435c
No. 10 blue anl. sheets, Chi.	5.45c
No. 10 blue anl. sheets, Cleve.	5.35c
No. 10 blue anl., Buffalo	5.40c
No. 10 blue anl., sheets, St. L.	5.52c
No. 10 blue anl. sheets, Cinci.	5.435c
No. 10 blue anl. sheets, St. Paul	5.57c
No. 10 blue anl. sh., Detroit	5.435c
No. 28 black sheets, Chgo.	6.45c
No. 28 black sheets, Cleve.	6.35c
No. 28 black sheets, Cinci.	5.45c
No. 28 black, Detroit	6.435c
No. 28 black sheets, St. L.	6.52c
No. 28 black sheets, St. Paul	6.57c
No. 28 galv. sheets, Chgo.	7.70c
No. 28 galv. sheets, Cleve.	7.60c
No. 28 galv. sheets, Cinci.	6.635c
No. 28 galvanized, Detroit	7.685c
No. 28 galv. sheets, St. L.	7.77c
Hoops, Cleveland	4.885c
Hoops, Detroit	4.935c

IRON AND STEEL SCRAP

STEEL WORKS USE
(Gross Tons)

Bundled sheets, Pittsburgh	**$22.00 to 23.00**
Bundled sheets, Cleveland	24.50 to 25.25
Bundled sheets, Buffalo	22.00 to 24.00
City wrought, short, N. Y.	26.00 to 26.50
Frogs, switches, guards, St. L.	30.00 to 31.00
Frogs, switches, guards, Chgo.	30.00
Heavy melting steel, Pitts.	30.00
Heavy melting steel, Buffalo	30.00
Heavy melting steel, Chgo.	30.00
Heavy melt'g steel, Cleveland	30.00
Heavy melting steel, Cinci.	**27.00 to 27.50**
Heavy melting steel, east. Pa.	30.00
Heavy melting steel, N. Y.	29.50 to 30.00
Heavy melting steel, St. L.	29.00 to 29.25
Heavy melting steel, Birming.	23.00 to 24.00
Hydraulic press. sheets, Cleve.	27.50 to 28.50
Hydraulic press. sheets, Pitts.	27.00 to 28.00
Hydraulic press. sheets, Chgo.	27.00 to 27.50
Low phos. steel, Buffalo	40.00
Low phos. steel, Pittsburgh	40.00
Low phos. steel, eastern Pa.	40.00
Shoveling steel, Chicago	**30.00**
Shoveling steel, St. Louis	27.50 to 28.00
Steel rails, short, Chicago	34.00 to 34.50
Steel rails, short, Cleveland	32.00 to 33.00
Steel rails, short, St. Louis	36.50 to 37.00
Steel rails, old, Birmingham	28.00 to 30.00
Stove plate, Cincinnati	16.50 to 17.00
Stove plate, St. Louis	20.50 to 21.00
Stove plate, N. J. points	21.50
Stove plate, Birmingham	19.50 to 21.50
Stove plate, Buffalo	25.00
Stove plate, eastern Pa.	23.50 to 24.50
Stove plate, Cleveland	19.00 to 20.00
Stove plate, Pittsburgh	**20.00 to 21.00**
Cast iron borings	11.00 to 12.00

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$21.00 to 22.00
Boiler plate, cut, No. 1, St. L.	23.50 to 24.00
Bundled sheets, Cincinnati	17.00 to 17.50
Knuckles, coup., Chicago	34.00 to 34.50
Knuckles, coup., St. Louis	31.50 to 32.00
Springs, Chicago	39.50 to 40.00
Stove plate, Chicago	22.00 to 23.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.	3.50
Boston	3.70
Philadelphia	3.30
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:	
Albany, N. Y.	$1.26
New England (rail)	3.10
New York and Brooklyn (rail)	3.10
Virginia furnaces to:	
Philadelphia	$3.27
New England	3.77
Brooklyn, Jersey City, Newark	3.52
Birmingham, Ala., to:	
Boston	6.00
Cincinnati	2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	6.00
Philadelphia (r. and w.)	5.25
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.15
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:	
Minneapolis-St. Paul	$1.25
Mayville, Wis.:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	19.5 cents
Philadelphia	18.5 cents
Boston	21.5 cents
Buffalo	16.0 cents
Baltimore	18.0 cents
Cleveland	13.5 cents
Cincinnati	17.0 cents
Chicago	21.5 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	79.0 cents
St. Louis	27 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	75 cents
Pacific coast (tin plate)	75 cents

IRON MILL USE
(Gross Tons)

Busheling, No. 1, Cleveland	30.00 to 31.00
Busheling, No. 1, Buffalo	30.00
Busheling, No. 2, Buffalo	22.00 to 24.00
Busheling, No. 1, Pittsburgh	**21.00 to 22.00**
Cast borings, New York	17.50
Cast borings, eastern Pa.	19.00 to 20.00
Cast borings, Cleveland	20.00
Cast borings, Buffalo	19.00 to 20.00
Cast borings, Pittsburgh	20.00
Cast borings, Birmingham	13.00 to 15.00
Cast borings, Chgo.	19.00 to 19.50
City wrought, long, N. Y.	31.00 to 32.00
Cut forge, Chicago	35.00
Forge flashings, small, Cleve.	26.00 to 26.50
Forge flashings, large, Cleve.	27.50 to 28.00
Forge No. 1, Eastern Pa.	24.00 to 25.00
Grate bars, Buffalo	25.00
Grate bars, Cleveland	20.00 to 21.00
Grate bars, N. J. points	21.50
Iron axles, Pittsburgh	**42.00 to 44.00**
Iron axles, Cincinnati	**42.00 to 42.50**
Iron axles, Cleveland	47.50
Iron axles, eastern Pa.	47.50
Iron axles, Chicago	47.50
Iron axles, Buffalo	45.00 to 47.00
Iron rails, Chicago	39.00 to 40.00
Iron rails, Buffalo	37.00 to 38.00
Iron rails, Cincinnati	32.00 to 32.50
Iron rails, St. Louis	34.00 to 35.00
Iron rails, Cleveland	35.00
Machine turnings, Cleve.	20.00
Machine turnings, Buffalo	18.00 to 18.50
Machine turnings, N. Y.	16.00 to 16.50
Machine turnings, Pitts.	20.00
Machine turnings, east. Pa.	18.50 to 19.50
Machine turnings, Birming.	17.00 to 18.00
Machine turnings, Chgo.	19.00 to 19.50
Pipes and flues, Cleveland	23.75 to 24.75
R. R. mch. cast, No. 1, Buff.	30.00
R. R. wrgt. No. 1, Buffalo	35.00
R. R. wrgt., No. 1, east, Pa.	35.00
Railroad wrgt., No. 1, Cleve.	35.00
R. R. wrought, No. 1, Pitts.	35.00
Railroad wr'ght, No. 1, Chgo.	35.00
Railroad wr'ght, No. 2, Chgo.	35.00
R. R. wrgt. No. 1, Birming.	28.00 to 32.00
Wrought pipe, Buffalo	29.00
Wrought pipe, eastern Pa.	30.00 to 32.00
Wrought pipe, New York	31.00

(Net Tons)

Angle bars, iron, Chicago	$38.00 to 38.50
Angle bars, steel, St. Louis	29.00 to 29.50
Arch bars & transoms, St. L.	42.00 to 42.50
Arch bars & transoms, Chgo.	38.00 to 39.00
Busheling, No. 1, Chicago	26.00 to 27.00
Busheling, No. 1, Cincinnati	**21.00 to 21.50**
Busheling, No. 1, St. Louis	26.00 to 26.50
Busheling, No. 2, Chicago	17.50 to 18.50
Cast borings, Cincinnati	13.00 to 13.50
Cast borings, St. Louis	16.00 to 16.50
Iron axles, St. Louis	45.00 to 45.50
Iron axles, Chicago	47.00 to 48.00
Machine turnings, Cinci.	13.00 to 13.50
Machine turnings, St. L.	16.75 to 17.25
Pipes and flues, Chicago	23.50 to 24.50
Pipes and flues, St. Louis	23.50 to 24.00
Railroad wrgt., No. 1, Cinci.	28.50 to 29.00
Railroad wrgt., No. 1, St. L.	31.00 to 31.50
Railroad wrgt., No. 2, St. L.	29.50 to 30.00

IRON OR STEEL WORKS USE
(Gross Tons)

Axle turnings, Cleveland	$24.00 to 25.00
Axle turnings, Buffalo	26.50 to 27.00
Shafting, New York	37.50 to 38.00
Shafting, eastern Pa.	45.00 to 47.50
Steel car axles, Birmingham	32.00 to 33.00
Steel car axles, New York	45.50 to 46.00
Steel car axles, Buffalo	45.00 to 47.00
Steel car axles, Cleveland	45.00
Steel car axles, Pittsburgh	**40.00 to 42.00**
Steel car axles, eastern Pa.	47.50
Steel car axles, Chgo.	47.50

(Net Tons)

Shafting, St. Louis	32.00 to 32.50
Steel car axles, St. Louis	42.50 to 43.00

IRON FOUNDRY USE
(Gross Tons)

Car wheels, (iron), Pitts.	$30.00
Car wheels, (steel), Pitts.	**33.00 to 35.00**
Car wheels, eastern Pa.	33.00 to 35.00
Car wheels, Buffalo	30.00
Car wheels, Chicago	30.00
Car wheels, St. Louis	29.50 to 30.00
Car wheels, Birmingham	25.00 to 30.00
Car wheels, Cleveland	30.00
Tram car wheels, Birming.	20.00 to 25.00
Cast, No. 1, Birmingham	25.00 to 27.50
Cast, 1, machy. N. J. points	29.50 to 30.00
Cast No. 1, Cleveland	30.00
Cast, 1, heavy, N. J. points	29.50 to 30.00
Cast, 1, machy., N. J. points	30.00
Cast No. 1 Chgo.	30.00
Cast, No. 1, Pittsburgh	28.00 to 29.00
Malleable railroad, Cincinnati	21.50 to 22.50
Malleable railroad, Cleveland	30.00
Malleable railroad, Buffalo	30.00
Malleable railroad, Pittsburgh	30.00
Malleable railroad, east. Pa.	**30.00 to 32.00**
Malleable railroad Chgo.	30.00
Malleable, agricultural, Chgo.	30.00

(Net Tons)

Cast, No. 1, Cincinnati	**26.00 to 26.50**
Cast, No. 1, St. Louis	24.50 to 25.00
Malleable railroad, St. Louis	25.00 to 26.00
Malleable agricultural, Chgo.	**24.00 to 25.00**
Malleable agricultural, St. L.	23.50 to 24.00

MISCELLANEOUS USES
(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$35.00
Reroll. rails, 5 ft. & ov., Chgo.	35.00
Reroll. rails, 5 ft. & ov., E. Pa.	35.00
Reroll. rails, 5 ft. & ov., St. L.	34.50 to 35.00
Reroll. rails, 5 ft. or ov., Cleve.	**37.00 to 38.00**
Rerolling rails, long, Birming.	**37.50 to 38.50**
Locomotive tires, Chgo.	42.50 to 43.50

(Net Tons)

Boiler punchings, Chicago	31.50 to 32.00
Locomotive tires, St. Louis	33.50 to 34.00